Telephony

THE AMERICAN TELEPHONE JOURNAL

PUBLISHED EVERY WEEK
BY TELEPHONY PUBLISHING CORP.
608 S. DEARBORN ST., CHICAGO, ILL.

JUNE 23, 1923. [VOL. 84. NO. 25.]
Entered as second-class matter Sept. 4, 1903, at the post office at Chicago, Ill., under act of March 3, 1879.

SINGLE COPIES 10 CENTS
YEARLY, U. S. A., $3; CANADA, $4
ALL OTHER COUNTRIES, $5

Keeping count of calls handled daily means keeping informed on traffic tendencies—keeping ahead of service requirements.

Veeder

Counts the Calls

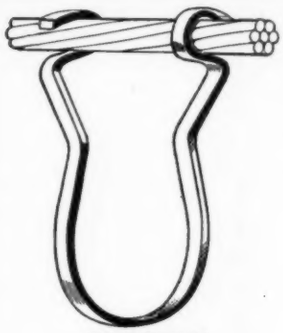
Gets into permanent socket in the keyboard; registers one for each pressure of the thumb lever.

Counters—attached to the keyboards—enable you to take peribdic counts, give you data for forehanded management and show you the volume handled by each operator.

Send for booklet

Veeder Mfg. Co., 11 Sargeant St., Hartford, Conn.

NATIONAL



CABLE RING

Junior Cable Rings

—a fixture on your lines because they are designed for durability.

—grips with a "never-say-die" spirit.

—less work for your linemen; less tiresome to the hand.

—easy to put on — accomplished with one hand.

—the harder the pull the more forceful the gripping power.

POPULAR BECAUSE

—they cost less in the final analysis.
—they mean modern practice to the lineman.

National Junior Cable Rings are made by a company that has made a practical study of telephone construction work over a period of many years. Not simply striving to obtain the initial order, but aiming to keep the customer satisfied with prompt deliveries and co-operative efforts, is responsible for the endorsement by telephone companies who prefer NATIONAL Telephone Supplies.

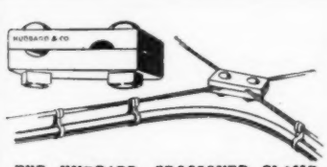
MANUFACTURED BY
THE NATIONAL TELEPHONE SUPPLY CO.
5100 Superior Ave. Cleveland, Ohio

American Steel & Wire Co.'s
W & M Telephone Telegraph Wire
Strand—STEEL WIRE
Pole Steps
Descriptive literature—free
American Steel & Wire Company
Chicago
New York

EVERSTICK ANCHORS
lead the world in anchor sales.
WHY?

EVERSTICK Anchor Co.
St. Louis, Mo.
U. S. A.

CEDAR POLES
Treated or Plain
Pentrex a Specialty
NATIONAL POLE CO.
ESCANABA :: :: MICH.
220 Broadway, New York
2344 Summit St., Toledo Ohio
Rialto Bldg, San Francisco



THE HUBBARD CROSSOVER CLAMP
Used for joining two cable messengers when they cross each other at right angles.
Ask your Jobber.
HUBBARD & COMPANY
Pittsburgh — Chicago
The Hardware makes the line; Hubbard makes the Hardware.

TRADE MARK Red Devil Tools

"Red Devil" Electrician's Auger Bit

The harder the wood the faster it cuts

THE "Red Devil" Bit is constructed unlike other bits. The single scorer and one cutting lip takes up a chip twice as big as any ordinary double lip bit. This reduces the friction one-half.

The "Red Devil" is 33⅓% easier boring, has 10% greater clearance, bores with or against the grain of any wood.

Tell your dealer to show you "Red Devil" Auger Bits. If out of stock, he will get them for you.

Electrician's tool booklet free

SMITH & HEMENWAY CO., INC.
Manufacturers of "Red Devil" Tools
87 Coit Street Irvington, N. J.

FORT WAYNE PRINTING COMPANY
FORT WAYNE, IND.
Printers and Blank Book Manufacturers
Write for Samples and Prices on I. C. C. Forms
Ours Are the Best

Telephone Cables
ALL SIZES AND CAPACITIES
Hard Drawn Copper Telephone Wire
AMERICAN ELECTRICAL WORKS
PHILLIPSDALE, R. I.
CHICAGO—112 W. Adams St.
CINCINNATI—Traction Building
NEW YORK—Pershing Square Bldg.
BOSTON—176 Federal St.

"INSULATE"
(Shellac Composition)
and
"HI-HEET"
(Synthetic)
100 Style
Receiver Cases
Knobs
Mouthpieces, etc.
In stock for prompt shipment
GENERAL INSULATE CO.
1007-15 Atlantic Ave.
Brooklyn, N. Y.
Est. 1904

Leich Magneto Multiple Switchboards

are used by the most progressive telephone companies of the Central West.

The Leich Magneto multiple switchboard solved their operating problems. Yours may be similar.

Write to some of the companies listed below for their candid opinion regarding the installations. You will then know first hand the advantages they have gained.

Jackson Telephone Co.....Jackson, Minn.
Morenci Telephone Co.....Morenci, Mich.
Shell Rock Valley Telephone Co...Greene, Iowa
Archbold Telephone Co.....Archbold, Ohio
Jefferson County Telephone Co.
.....Charles Town, W. Va.
Richwood Telephone Co.....Richwood, Ohio
Mechanicsburg Telephone Co.
.....Mechanicsburg, Ohio
Jasper County Telephone Co...Rensselaer, Ind.
Hoosier Telephone Co.....Salem, Ind.
Polo Telephone Co.....Polo, Ill.
Pearl City Ind. Telephone Co.....Lena, Ill.
Prophetstown Mutual Telephone Co.
.....Prophetstown, Ill.
Salem Telephone Co.....Salem, Mo.
Whitley County Telephone Co., S. Whitley, Ind.
Lee County Farmers Telephone Co..Amboy, Ill.
Ligonier Telephone Co.....Ligonier, Ind.
Geneseo Telephone Co.....Geneseo, Ill.
Argos Telephone Co.....Argos, Ind.
Bourbon Telephone Co.....Bourbon, Ind.
Lanark Mutual Telephone Co.....Lanark, Ill.
Coon Bros. Telephone Co.....Rantoul, Ill.

LEICH ELECTRIC CO.

Telephones, Switchboards, Accessories

GENOA, ILLINOIS

DISTRIBUTORS

ELECTRIC APPLIANCE COMPANY
Chicago, Dallas, San Francisco, New Orleans

ST. PAUL ELECTRIC CO.
St. Paul, Minn.

POST GLOVER ELECTRIC CO.
Cincinnati, Ohio

TELEPHONE & ELECTRIC SUPPLY CO.
Spokane, Wash.

B-R ELECTRIC COMPANY
Kansas City, Mo.

Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Telephone Weekly, Telephone Magazine, Telephone Securities, The Telephone, Sound Waves
PUBLISHED WEEKLY BY TELEPHONY PUBLISHING CORP.
608 S. Dearborn St. Chicago

H. D. FARGO, President and Treasurer.
S. R. EDWARDS, Editor and Secretary.

J. R. HASTIE, Vice-President and Advertising Manager.
H. D. FARGO, Jr., Western Advertising Manager.

Entered as second-class matter September 4, 1908, at the post office at Chicago, Ill., under act of March 3, 1879.

Volume 84
Number 25

CHICAGO, SATURDAY, JUNE 23, 1923

Subscription—10 Cents a Copy
$3 a Year U. S., Cuba and Mexico
$4 Canada, $5 Other Countries

STATISTICS ON TELEPHONE GROWTH

There is no slackening of the public demand for telephone service, apparently, either in the cities or in the smaller communities and rural districts. Wherever a thrifty citizen builds a home, or a group of enterprising Americans starts either a town or even a factory, there at once is created an opportunity for additional telephones.

The federal government, in describing the big irrigation projects in the Western States, refers to the enlarged opportunities for farming thereby furnished, and especially reminds the telephone interests that the opening of these districts will be immediately followed by a demand for telephone lines.

The press bulletin issued by the Illinois Bell Telephone Co. states that the estimated telephone growth of the next five years exceeds all previous records for a like period. This forecast is probably based on the surveys which the parent organization makes in order to provide for future requirements. Los Angeles, Calif., expects to double its 196,000 telephones in the next five years.

* * * *

If the demands for service in the next five years outstrip past records, the whole telephone industry will have need of all its resources to meet the situation—in capital, in manufacturing output and in men to handle the job.

Since 1900, the figures show, the population of the United States has increased 45 per cent, while the increase in the number of telephones has been about 1,240 per cent. According to the statistical experts the present growth of telephones is at a rate three times as rapid as the rise in population, but we doubt the absolute accuracy of this assertion.

The telephone follows population. A booming town, growing in population over night, clamors for telephones. When for some reason wholesale desertions befall a community, telephones are taken out. Probably they eventually re-appear at other places where the shifting population locates, so that the net loss the country over is negligible.

In affirming that the telephone growth is three times as rapid as the increase in population, the Bell bulletin adds that "saturation is still far off."

* * * *

Statistics showing the magnitude of their industry are always of interest to telephone men.

January 1, 1923, New York City had 1,072,632 telephones in service, which is more than there are in the entire country of Great Britain, which had 1,028,258. Chicago, with more than 650,000, has more telephones than all of France. Philadelphia, alone, with close to 300,000, has more telephones than both Belgium and The Netherlands. Boston has more than Philadelphia. Pittsburgh has a little less than 200,000, but has more than all of Italy.

Los Angeles, San Francisco, Detroit, Cleveland and St. Louis are now approaching the 200,000 mark.

But it is in the smaller towns and the farming districts that American telephone development towers still more impressively over that of all other countries. Its influence is plainly noticeable across the border in Canada.

* * * *

There are only 4,400 telephones on all the farms in Great Britain, according to the latest statistics. In the Canadian province of Saskatchewan there are 58,000 rural telephones, which is about one to every nine people in the province. Canada, it seems, patterns after the United States rather than England, in the matter of rural telephone development, and finds it pays.

In Saskatchewan the distances are wide and the population meager, but the telephone lines reconcile the settlers in the newly-opened sections to a life which otherwise would be extremely lonely. More than 4,000 miles of new rural telephone lines were constructed in Saskatchewan and Alberta alone last year.

* * * *

Government figures say there are 3,000,000 farm telephones in the United States. This is believed to be short of the actual number. The extensive irrigation projects in the West and Southwest will open millions of acres to farmers and fruit-raisers within the next two years, and create a demand for much additional telephone equipment, as telephone service is one of the first things they plan for in their new homes.

* * * *

In Great Britain the telephone system, it will be remembered, is operated by the government whose management has not succeeded in popularizing the service. The

superiority of American service (which is admitted by the English) no doubt is an important reason for the United States' supremacy, but the comparative figures bear testimony to the fact that private ownership does a better job than government administration.

* * * *

The fact that there are 13.6 telephones in the United States to every 100 population, whereas in Britain there are but two telephones per 100 people, is a discomforting fact to the English observers. A recent editorial in the London Daily Telegraph discusses the matter in a fashion which reveals considerable disquietude.

"Figures demonstrate," it says, "what every one familiar with life in the United States and Canada has discovered by observation, that we are far behind in the application of the telephone to daily life. In Great Britain, according to the latest statistics, there are only two telephones per 100 people, while in the United States there are 13.6 telephones; in Sweden, 6.4, and even in Norway 4.4.

There is no denying this evidence that, from whatever cause, the telephone is not as much used in this country as in others which, we may be allowed to believe, are not more highly developed or better organized."

The editorial goes on to say that it would be superfluous to argue about the advantage of increased development and greater use of the telephone, and then asks: "Why, then, is it that we have set up less than half the telephones per 100 of us that Norway needs, and less than one-sixth of the number they demand in America?"

In answering this query the editor places the blame on the government management, as he adds: "The main reason, we take it, is that the post office has not yet put the telephone within the reach of more than a limited number of the population. A secondary reason is that the service offered is not sufficiently good to tempt those who can manage their affairs without it."

* * * *

Better service, lower rates and the private initiative which seeks to extend its business and please and keep its patrons, are the reasons why the American telephone industry has outstripped the achievements of the European governments that are in control of the business "over there."

That is why the United States has 65 per cent of all the telephones in the world.

Discussion of Reproduction Cost

Complete Text of Dissenting Opinion in the Case of the Southwestern Bell Telephone Co. vs Missouri Public Service Commission Filed by Justice Brandeis and Concurred In by Justice Holmes of U. S. Supreme Court

I concur in the judgment of reversal. But I do so on the ground that the order of the state commission prevents the utility from earning a fair return on the amount prudently[1] invested in it. Thus, I differ fundamentally from my brethren concerning the rule to be applied in determining whether a prescribed rate is confiscatory. The court, adhering to the so-called rule of Smyth v. Ames, and further defining it, declares that what is termed value must be ascertained by giving weight, among other things, to estimates of what it would cost to reproduce the property at the time of the rate hearing.

The so-called rule of Smyth v. Ames is, in my opinion, legally and economically unsound. The thing devoted by the investor to the public use is not specific property, tangible and intangible, but capital embarked in the enterprise. Upon the capital so invested the Federal Constitution guarantees to the utility the opportunity to earn a fair return.[2] Thus, it sets the limit to the power of the state to regulate rates.

The Constitution does not guarantee to the utility the opportunity to earn a return on the value of all items of property used by the utility, or of any of them. The several items of property constituting the utility, taken singly, and freed from the public use, may conceivably have an aggregate value greater than if the items are used in combination. The owner is at liberty, in the absence of controlling statutory provision, to withdraw his property from the public service; and, if he does so, may obtain for it exchange value. Compare Brooks-Scanlan Co. v. Railroad Commission of Louisiana, 251 U. S. 396; Erie Railroad Co. v. Public Utility Commissioners, 254 U. S. 394, 411; Texas v. Eastern Texas R. R. Co., 258 U. S. 204. But so long as the specific items of property are employed by the utility, their exchange value is not of legal significance.

The investor agrees, by embarking capital in a utility, that its charges to the public shall be reasonable. His company is the substitute for the state in the performance of the public service; thus becoming a public servant. The compensation which the Constitution guarantees an opportunity to earn is the reasonable cost of conducting the business.

Cost includes not only operating expenses, but also capital charges. Capital charges cover the allowance, by way of interest, for the use of the capital, whatever the nature of the security issued therefor; the allowance for risk incurred; and enough more to attract capital. The reasonable rate to be prescribed by a commission may allow an efficiently managed utility much more. But a rate is constitutionally compensatory, if it allows to the utility the opportunity to earn the cost of the service as thus defined.

To decide whether a proposed rate is confiscatory, the tribunal must determine both what sum would be earned under it, and whether that sum would be a fair return. The decision involves ordinarily the making of four subsidiary ones:

1. What the gross earnings from operating the utility under the rate in controversy would be. (A prediction.)

2. What the operating expenses and charges, while so operating, would be. (A prediction.)

3. The rate base, that is, what the amount is on which a return should be earned. (Under Smyth v. Ames, an opinion, largely.)

4. What rate of return should be deemed fair. (An opinion, largely.)

A decision that a ratio is confiscatory (or compensatory) is thus the resultant of four subsidiary determinations. Each of the four involves forming a judgment, as distinguished from ascertaining facts. And as to each factor, there is usually room or difference in judgment. But the first two factors do not ordinarily present serious difficulties.

The doubts and uncertainties incident to prophecy, which affect them, can, often, be resolved by a test period; and meanwhile

---

[1]The term prudent investment is not used in a critical sense. There should not be excluded from the finding of the base, investments which, under ordinary circumstances, would be deemed reasonable. The term is applied for the purpose of excluding what might be found to be dishonest or obviously wasteful or imprudent expenditures. Every investment may be assumed to have been made in the exercise of reasonable judgment, unless the contrary is shown.

[2]Except that rates may, in no event, be prohibitive, exorbitant, or unduly burdensome to the public. Covington & Lexington Turnpike Co. v. Sanford, 164 U. S. 578, 596; Smyth v. Ames, 169 U. S. 466, 544; San Diego Land & Town Co. v. National City, 174 U. S. 739, 757; Minnesota Rate Cases, 230 U. S. 353, 454; Mr. Justice Miller in Chicago, Milwaukee & St. Paul Ry. Co. v. Minnesota, 134 U. S. 418, 459.

protection may be afforded by giving a bond. Knoxville v. Knoxville Water Co., 212 U. S. 1, 18, 19; St. Louis, Iron Mountain & Southern Railway Co. v. McKnight, 244 U. S. 368. The doubts and uncertainties incident to the last two factors can be eliminated, or lessened, only by redefining the rate base, called value, and the measure of fairness in return, now applied under the rule of Smyth v. Ames.

The experience of the 25 years since that case was decided has demonstrated that the rule there enunciated is delusive. In the attempt to apply it, insuperable obstacles have been encountered. It has failed to afford adequate protection either to capital or to the public. It leaves open the door to grave injustice.

To give to capital embarked in public utilities the protection guaranteed by the Constitution, and to secure for the public reasonable rates it is essential that the rate base be definite, stable, and readily ascertainable; and that the precentage to be earned on the rate base be measured by the cost, or charge, of the capital employed in the enterprise. It is consistent with the Federal Constitution for this court now to lay down a rule which will establish such a rate base and such a measure of the rate of return deemed fair. In my opinion, it should do so.

The rule of Smyth v. Ames sets the laborious and baffling task of finding the present value of the utility. It is impossible to find an exchange value for a utility, since utilities, unlike merchandise or land, are not commonly bought and sold in the market. Nor can the present value of the utility be determined by capitalizing its net earnings, since the earnings are determined, in large measure, by the rate which the company will be permitted to charge; and, thus, the vicious circle would be encountered.

So, under the rule of Smyth v. Ames, it is usually sought to prove the present value of a utility by ascertaining what it actually cost to construct and instal it; or by estimating what it should have cost; or by estimating what it would cost to reproduce, or to replace it. To this end an enumeration is made of the component elements of the utility, tangible, and intangible.[3] Then the actual, or the proper, cost of producing, or of reproducing, each part is sought. And finally, it is estimated how much less than the new each part, or the whole, is worth; that is, the depreciation is estimated.[4]

Obviously each step in the process of estimating the cost of reproduction, or replacement, involves forming an opinion, or exercising judgment, as distinguished from merely ascertaining facts. And this is true, also, of each step in the process of estimating how much less the existing plant is worth, than if it were new.

There is another potent reason why, under the rule of Smyth v. Ames, the room for difference in opinion as to the present value of a utility is so wide. The rule does not measure the present value either by what the utility cost to produce; or by what it should have cost; or by what it would cost to reproduce, or to replace it.[5] Under that rule the tribunal is directed, in forming its judgment, to take into consideration all those and also, other elements, called relevant facts.[6]

Obviously "value" cannot be a composite of all these elements. Nor can it be arrived at on all these bases. They are very different; and must, when applied in a particular case, lead to widely different results. The rule of Smyth v. Ames, as interpreted and applied, means merely that all must be considered. What, if any, weight shall be given to any one, must practically rest in the judicial discretion of the tribunal which makes the determination. Whether a desired result is reached may depend upon how any one of many elements is treated.

It is true that the decision is usually rested largely on records of financial transactions, on statistics and calculations. But as stated in Louisville v. Cumberland Telegraph & Telephone Co., 225 U. S. 430, 436, "every figure . . . that we have set down with delusive exactness" is "speculative."

The efforts of courts to control commissions' findings of value have largely failed. The reason lies in the character of the rule declared in Smyth v. Ames. The rule there stated was to be applied solely as a means of determining whether rates already prescribed by the legislature were confiscatory. It was to be applied judicially after the rate had been made; and by a court which had had no part in making the rate. When applied under such circumstances the rule, although cumbersome, may occasionally be effective in destroying an obstruction to justice, as the action of a court is, when it sets aside the verdict of a jury. But the commissions undertook to make the rule their standard for constructive action.

They used it as a guide for making, or approving, rates. And the tendency developed to fix as reasonable the rate which is not so low as to be confiscatory.[7] Thus the rule which assumes that rates of utilities will ordinarily be higher than the minimum required by the Constitution has, by the practice of the commissions, eliminated the margin between a reasonable rate and a merely compensatory rate; and, in the process of rate making, effective judi-

---

[3]In estimating replacement cost the first step is to determine what part of the property owned is used and useful in the public service. That involves, among other things, a consideration of retired or discarded property and the question whether the size and capacity of the plant are, in part, excessive.

The property included in the valuation is commonly treated under the following heads (See Report of Special Committee on Valuation, Amer. Society of Civil Engineers, October 28, 1916, 42 Proceedings, pp. 1708-1938):

A. Tangibles:
   (a) Land and buildings.
   (b) Plant.
B. Incidentals during construction:
   (a) Administration.
   (b) Engineering and superintendence.
   (c) Legal Expenses.
   (d) Brokerage.
   (e) Promotion fees.
   (f) Insurance.
   (g) Taxes.
   (h) Bond discount.
   (i) Contingencies.
C. Intangibles:
   (a) Good will.
   (b) Franchise value.
   (c) Going concern value.
   (d) Working capital.

"Going value" was declared by the special report (p. 1727) to embrace, among other things, "efficiency, favorable business arrangements and design"; intangibles to include also "leases, easements, water rights, traffic and operating agreements, strategic location and advantages and other privileges."

[4]Several different methods are used for measuring depreciation: (1) The replacement method; (2) the straight-line method; (3) the compound interest method; (4) the sinking fund method; (5) the unit cost method. It is largely a matter of judgment whether, and to what extent, any one of these several methods of depreciation should be applied. They may give widely different results. Special report, October 28, 1916, Valuation of Public Utilities, Amer. Society of Civil Engineers, Vol. 42 Proceedings, pp. 1723-1727; 1846-1900.

[5]This court declared in Smyth v. Ames, 169 U. S. 466, 547, that "present as compared with original cost of construction" is to be considered; and in Minnesota Rate Cases, 230 U. S. 352, 452, that "the cost-of-reproduction method is of service in ascertaining the present value of the plant, when it is reasonably applied and when the cost of reproducing the property may be ascertained with a proper degree of certainty." Reproduction cost was thus held to be evidence of value. But it has never been held to be the measure of value.

[6]Some of these so-called relevant facts are, as the rule has been applied:
(a) Capitalization, i. e., bonds, stock and other securities outstanding.
(b) Book cost, i. e., the investment account as shown on the books.
(c) Actual cost, i. e., amounts actually paid in cash for installing the original plant and business, and the additions thereto.
(d) Historical cost, i. e., the proper cost of the existing plant and business, estimated on the basis of the price levels existing at the respective dates when the plant and the additions were constructed. This is often called prudent investment. Historical cost would, under normal conditions, be equal in amount to the original cost. The phrases are sometimes used to denote the same thing. But they are not the same; and they are often ascertained by different processes.

Original cost is the amount actually paid to establish the utility. The amount is ascertained, where possible, by inspection of books and vouchers, and by other direct evidence. If this class of evidence is not complete, it may be necessary to supplement it by evidence as to what was probably paid for some items, by showing prices prevailing for work and materials at the time the same were supplied. But the evidence of these prices is merely circumstantial, or corroborative, evidence of the amount actually paid.

In determining actual cost, whatever the evidence, there is no attempt to determine whether the expenditure was wise or foolish, or whether it was useful or wasteful. Historical cost, on the other hand, is the amount which normally should have been paid for all the property which is usefully devoted to the public service. It is, in effect, what is termed the prudent investment. In enterprises efficiently launched and developed, historical cost and original cost would practically coincide both in items included and in amounts paid. That is, the subjects of expenditure would coincide; and the cost at prices prevailing at the time of installation would substantially coincide with the actual cost.

(e) Reproduction cost of plant and business—estimated on price levels prevailing at the date of valuation.
(f) Reproduction cost of plant and business, estimated on average price levels prevailing during periods of, say, five to ten years preceding the valuation.

[7]This, it appears, was the purpose of the board in Galveston Electric Co. v. City of Galveston, 258 U. S. 388.

cial review is very often rendered impossible.[8] The result, inherent in the rule itself, is arbitrary action, on the part of the rate regulating body. For the rule not only fails to furnish any applicable standard of judgment, but direct consideration of so many elements, that almost any result may be justified.

The adoption of present value of the utility's property, as the rate base, was urged in 1893, on behalf of the community; and it was adopted by the courts, largely as a protection against inflated claims based on what were then deemed inflated prices of the past. See argument in Smyth v. Ames, 169 U. S. 466, 479, 480; San Diego Land & Town Co. v. National City, 174 U. S. 739, 757, 758; San Diego Land & Town Co. v. Jasper, 189 U. S. 439, 442, 443; Stanislaus County v. San Joaquin & Kings River Canal & Irrigation Co., 192 U. S. 201, 214.

Reproduction cost, as the measure, or as evidence, of present value was, also, pressed then by representatives of the public who sought to justify legislative reductions of railroad rates.[9] The long depression which followed the panic of 1893 had brought prices to the lowest level reached in the 19th century. Insistence upon reproduction cost was the shippers' protest against burdens believed to have resulted from watered stocks, reckless financing, and unconscionable construction contracts. Those were the days before state legislation prohibited the issue of public utility securities without authorization from state officials; before accounting was prescribed and supervised; when outstanding bonds and stocks were hardly an indication of the amount of capital embarked in the enterprise; when depreciation accounts were unknown; and when book values, or property accounts, furnished no trustworthy evidence either of cost or of real value.

Estimates of reproduction cost were then offered, largely as a means, either of supplying lacks in the proof of actual cost and investment, or of testing the credibility of evidence adduced, or of showing that the cost of installation had been wasteful. For these purposes, evidence of the cost of reproduction is obviously appropriate.

At first reproduction cost was welcomed by commissions as evidence of present value. Perhaps it was because the estimates then indicated values lower than the actual cost of installation. For, even after the price level had begun to rise, improved machinery and new devices tended for some years to reduce construction costs.[10]

Evidence of reproduction costs was certainly welcomed, because it seemed to offer a reliable means for performing the difficult task of fixing, in obedience to Smyth v. Ames, the value of a new species of property to which the old tests—selling price or net earnings—were not applicable. The engineer spoke in figures—a language implying certitude. His estimates seemed to be free of the infirmities which had stamped as untrustworthy the opinion evidence of experts common in condemnation cases.

Thus, for some time, replacement cost, on the basis of prices prevailing at the date of the valuation, was often adopted by state commissions as the standard for fixing the rate base. But gradually it came to be realized that the definiteness of the engineer's calculations was delusive; that they rested upon shifting theories; and that their estimates varied so widely as to intensify, rather than to allay doubts.[11]

When the price levels had risen largely, and estimates of replacement cost indicated values much greater than the actual cost of installation, many commissions refused to consider valuable what one declared to be assumptions based on things that never happened and estimates requiring the projection of the engineer's imagination into the future and methods of construction and installation that have never been and never will be adopted by sane men.[12]

Finally, the great fluctuation in price levels incident to the World War led to the transfusion of the engineer's estimate of cost with the economist's prophecies concerning the future price plateaus. Then, the view that these estimates were not to be trusted as evidence of present value was frequently expressed. And state utility commissions, while admitting the evidence in obedience to Smyth v. Ames, failed, in ever-increasing numbers, to pay heed to it in fixing the rate base.[13]

The conviction is widespread that a sound conclusion as to the actual value of a utility is not to be reached by a meticulous study of conflicting estimates of the cost of reproducing new the congerie of old

---

[8]A rate order will not be set aside, unless the evidence compels conviction that a fair-minded board could not have reached the conclusion that the rate would prove adequate. San Diego Land & Town Co. v. National City, 174, U. S. 739, 754; San Diego Land & Town Co. v. Jasper, 189 U. S. 439, 442; Knoxville v. Knoxville Water Co., 212 U. S. 1, 17; Van Dyke v. Geary, 244 U. S. 39, 49; Galveston Electric Co. v. Galveston, 258 U. S. 388, 401, 402. The range for difference of opinion on each of the many factors to be taken into consideration in fixing the rate base is so wide that such compelling evidence can rarely be adduced, where the report filed recites that, after full hearing, all the so-called relevant facts were given consideration by the commission in reaching the decision made.

There may often be found in opinions of utility commissions, after a lengthy and detailed discussion of a vast quantity of expert opinion, a conclusion like the following from Re Illinois Northern Utilities Co., P. U. R. 1920 D, 979, 999:

"After considering all the evidence and arguments of counsel in this case, bearing upon the valuation of the properties herein involved, the investment therein, their original costs, cost to reproduce, and present values, including all overheads; preliminary costs; cost of engineering; supervision, interest, insurance, organization and legal expenses during construction; working capital; materials and supplies; and all other elements of value, tangible and intangible, and considering the plants are now going concerns in successful operation, the commission finds. . . . for the purpose of this proceeding, and for those purposes only, the fair rate-making values . . . as follows."

Hence, a commission's order must ordinarily be allowed to stand, unless it appears that there was some irregularity in the proceedings or that some erroneous rule of law was applied.

Since Smyth v. Ames this court has dealt with the validity (under the Fourteenth Amendment) of rate regulation by the states in over 50 cases. In only 25 of these has the court passed upon the question whether a rate fixed, or approved, by a state commission denied to the utility the opportunity of earning a fair return upon the fair value of the property. In none of these 25 cases has an order of a state commission, made after a full hearing, been declared void by this court, on the ground that the finding of the rate-base, or value, was too low. In none of them has the order been declared void on the ground that the commission fixed too low a percentage of return. Lower federal courts and state courts have occasionally intervened with effect. But the instances are relatively few as compared with the number of adverse decisions of the commissions. Even where orders fixing rates have been set aside for irregularity or error, the result of the new hearing is not always advantageous to the company.

[9]See Steenerson v. Great Northern Ry. Co., 69 Minn. 353, 374; San Diego Water Co. v. San Diego, 118 Calif. 556, 568; Metropolitan Trust Co. v. Houston & Texas Central R. R. Co., 90 Fed., 687, 688.

[10]Compare Mr. Justice Field in Railroad Commission Cases, 116 U. S. 307, 343, 344; Steenerson v. Great Northern Ry., 69 Minn. 353, 374.

[11]Thus in In re Marin Municipal Water District (Calif.) P. U. R. 1915 C, 433, 452, the several valuations of five experts were: $670,163; $723,001.85; $763,028; $919,204; $1,031,436. In Springfield v. Springfield Gas & Electric Co. (Ill.), P. U. R. 1916 C, 281, 307, the several valuations of five experts were $547,488; $588,262; $806,404; $898,785; $940,988. In Duluth Street Ry. Co. v. Railroad Commission (Wis.), P. U. R. 1915 D, 211, the valuations of two experts, both employed by the state, were $600,000 and $1,100,000.

[12]15 Mich. Law Rev. 205, 216; Re Grafton County Electric Light & Power Co. (N. H.), P. U. R. 1916 E, 879, 885-888. Compare Appleton Water Works Co. v. Railroad Commission, 154 Wis. 121, 154, quoting: "Skilled witnesses came with such prejudice in their minds that hardly any weight should be given to their evidence."

In Danbury v. Danbury & Bethel Gas & Electric Light Co., P. U. R. 1921 D, 193 at 206 (Conn.), the commission said:

"This method [reproduction at prices prevailing at time of valuation] of determining value usually includes percentages for engineering services never rendered, hypothetical efficiency of unknown labor, conjectured depreciation, opinion as to the condition of property, the supposed action of the elements; and, of course, its correctness depends upon whether superintendence was or would be wise or foolish; the investment improvident or frugal. It is based upon prophecy instead of reality, and depends so much upon half truths that it bears only a remote resemblance to fact, and rises at best, only to the plane of a dignified guess."

In Public Service Commission v. Pacific Telephone & Telegraph Co., P. U. R. 1916 D, 947, 955, the commission said: "The old methods have proven uncertain, indefinite and unsatisfactory to honest utilities and commissions alike."

See also In re Northampton Gas Petition (Mass.), P. U. R. 1915 A, 618, 626; Public Service Commission v. Pacific Telephone & Telegraph Co., P. U. R. 1916 D, 947, 955.

[13]Their action is in accord with views commonly held by legal writers. Compare Edwin C. Goddard, "Public Utility Valuation," 15 Mich. Law Rev. 205; Robert L. Hale, "The 'Physical Value' Fallacy in Rate Cases," 30 Yale Law Journal, 710; Donald R. Richberg, "A Permanent Basis for Rate Regulation," 31 Yale Law Journal, 263; Robert H. Whitten, "Fair Value for Rate Purposes," 27 Harv. Law Rev. 419; Henry W. Edgerton, "Value of the Service as a Factor in Rate Making," 32 Harv. Law Rev. 516; Gerard C. Henderson, "Railway Valuation and the Courts," 33 Harv. Law Rev. 902, 1031; Armstead M. Dobie, "Judicial Review of Administrative Action in Virginia," 8 Va. Law Rev. 477, 504. See also 32 Yale Law Journal, 390, 393; 19 Mich. Law Rev. 849.

machinery and equipment, called the plant, and the still more fanciful estimates concerning the value of the intangible elements of an established business.[14] Many commissions, like that of Massachusetts, have declared recently that "capital honestly and prudently invested must, under normal conditions, be taken as the controlling factor in fixing the basis for computing fair and reasonable rates."[15]

To require that reproduction cost at the date of the rate hearing be given weight in fixing the rate base, may subject investors to heavy losses when the high war and post-war price levels pass—and the price trend is again downward.[16]

The aggregate of the investments which have already been made at high costs since 1914, and of those which will be made before prices and costs can fall heavily, may soon exceed by far the depreciated value of all the public utility investments made therefore at relatively low cost. For it must be borne in mind that depreciation is an annual charge. That accrued on plants constructed in the long years prior to 1914 is much larger than that accruing on the properties installed in the shorter period since.[17]

That part of the rule of Smyth v. Ames which fixes the rate of return deemed fair, at the percentage customarily paid on similar investments at the time of the rate hearing also exposes the investor and the public to danger of serious injustice. If the replacement-cost measure of value and the prevailing-rate measure of fairness of return should be applied, a company which raised, in 1920, for additions to plant, $1,000,000 on a 9 per cent basis, by a stock issue, or by long-term bond issue, may find a decade later that the value of the plant (disregarding depreciation) is only $600,000, and that the fair return on money then invested in such enterprise is only 6 per cent.

Under the test of a compensatory rate, urged in reliance upon Smyth v. Ames, a prescribed rate would not be confiscatory, if it appeared that the utility could earn under it $36,000 a year; whereas $90,000 would be required to earn the capital charges. On the other hand, if a plant had been built in times of low costs, at $1,000,000 and the capital had been raised to the extent of $750,000 by an issue at par of 5 per cent 30-year bonds and to the extent of $250,000 by stock at par, and ten years later the price level was 75 per cent higher and the interest rates 8 per cent, it would be a fantastic result to hold that a rate was confiscatory, unless it yielded 8 per cent on the then reproduction cost of $1,750,000. For that would yield an income of $140,000, which would give the bondholders $37,500; and to the holders of the $250,000 stock $102,500, a return of 41 per cent per annum. Money required to establish in 1920 many necessary plants has cost the utility 10 per cent on 30-year bonds.

These long-time securities, issued to raise needed capital, will in 1930 and thereafter continue to bear the extra high rates of interest, which it was necessary to offer in 1920 in order to secure the required capital. The prevailing rate for such investments may in 1930 be only 7 per cent; or indeed 6 per cent; as it was found to be in 1904, in Stanislaus County v. San Joaquin Co., 192 U. S. 201; in 1909, in Knoxville v. Knoxville Water Co., 212 U. S. 1; and in 1912, in Cedar Rapids Gas Co. v. Cedar Rapids, 223 U. S. 655, 670. A rule which limits the guaranteed rate of return on utility investments to that which may prevail at the time of the rate hearing, may fall far short of the capital charge then resting upon the company.

In essence, there is no difference between the capital charge and operating expenses, depreciation and taxes. Each is a part of the current cost of supplying the service; and each should be met from current income. When the capital charges are for interest on the floating debt paid at the current rate, this is readily seen. But it is no less true of a legal obligation to pay interest on long-term bonds, entered into years before the rate hearing and to continue for years thereafter; and it is true also of the economic obligation to pay dividends on stock preferred or common.

The necessary cost, and hence the capital charge, of the money embarked recently in utilities, and of that which may be in-

---

[14] The Public Utility Reports for 1920, 1921, 1922 and 1923 (to March 1) contain 363 cases in which the rate-base or value was passed upon. Reproduction cost at unit prices prevailing at the date of valuation appears to have been the predominant element in fixing the rate base in only five. In 63 the commission severely criticised, or expressly repudiated, this measure of value. In nearly all of the 363 cases, except five, the commission either refused to pay heed to this factor as the measure of value, or indeed as evidence of any great weight.

The following summary shows the predominant element in fixing the rate base in the several cases:

In 5 cases: Reproduction cost at unit prices prevailing at the date of the valuation.

In 28 cases: Reproduction cost at unit prices prevailing at some date, or the average of some period, prior to the date of the valuation.

In 12 cases: Reproduction cost at unit prices prevailing at some date not specifically stated.

In 22 cases: Reproduction cost of an inventory of a prior date at prices prevailing at that date or prior thereto, plus subsequent additions at actual cost (so-called split inventory method).

In 3 cases: Reproduction cost on basis of future predicted prices (so-called trend prices, or new plateau method).

In 102 cases: A prior valuation by the commission plus the actual cost of subsequent additions.

In 85 cases: The actual original cost (including both initial cost and additions).

In 6 cases: Original cost arbitrarily appreciated.

In 27 cases: The historical cost or prudent investment.

In 28 cases: Book cost or investment.

In 12 cases: Bond and stock capitalization.

In 36 cases: Determination and classification of method impossible.

[15] Bay State Rate Case, P. U. R. 1916 F, 221, 233. And see ibid for a quotation from an address delivered at the "Conference on Valuation" in Philadelphia, November, 1915, in which the late John M. Eshleman, first president of the California Railroad Commission, said:

"If we had this problem at the beginning and were not attacking it in the middle, we would have no difficulty in agreeing with the holder of capital upon this subject, for he would quite readily agree to take the cost of doing the business plus an earning upon the money actually invested comparable to the earning offered in other available investments. Therefore, the cost of doing the business, plus a return upon the capital necessarily invested in the business, which return shall be as great as is offered in other businesses of similar hazard, is all that ought to be accorded for the future, and it is all that will be accorded if the public has any business sense. And if more is asked by the private owner, then he may expect no sympathy when he finds the public his competitor and his earning power impaired."

No case involving the fixing of rates by a commission has ever come to this court from New England. The only case involving in any way the validity of rates is Interstate Consolidated Street Ry. Co. v. Massachusetts, 207 U. S. 79.

See also Re Cripple Creek Water Co. (Colo.), P. U. R. 1916 C, 788, 799, 800; Butler v. Lewiston, Augusta & Waterville St. Ry. (Maine), P. U. R. 1916 D, 25, 35.

[16] Engineers testifying in recent rate cases have assumed that there will be a new plateau of prices. In Galveston Electric Co. v. Galveston, 258 U. S. 388, the company contended that a plateau 70 per cent above the price level of 1914 should be accepted, and a plateau 33 1/3 per cent above was found probable by the master and assumed to be such by the lower court. In Bluefield Water Works & Improvement Co. v. Public Service Commission (No. 256, October Term, 1922), one 50 per cent above the 1914 level was contended for; in the case at bar a plateau 25 per cent above.

But for the assumption that there will be a plateau, there is no basis in American experience. The course of prices for the last 112 years indicates, on the contrary, that there may be a practically continuous decline for nearly a generation; that the present price level may fall to that of 1914 within a decade; and that, later, it may fall much lower. Prices rose steadily (with but slight and short recessions) for the 20 years before the United States entered the World War. From the low level of 1897 they rose 21 per cent to 1900; then rose further (with minor fluctuations, representing times of good business or bad) and reached in 1914 a point 50 per cent above the 1897 level. Then the great rise incident to the war set in. "Wholesale Prices, 1890 to 1921," U. S. Department of Labor, Bureau of Labor Statistics, Bulletin No. 320, pp. 9-26. These are averages of the wholesale prices of all commodities. In the Bureau chart the 1913 prices are taken as the datum line (100). As compared with them the 1897 level was 67, the 1900 level 81. The chart on page 10 of the pamphlet, entitled "Price Changes and Business Prospects," published by the Cleveland Trust Co., gives price fluctuations for the 110 years prior to 1921. It shows three abrupt rises in the price level, by reason of war; and some less abrupt falls, by reason of financial panic. These may be called abnormal. But the normal has never been a plateau. The chart shows that the peak price levels were practically the same during the War of 1812, the Civil War, and the World War; and it shows that practically continuous declines, for about 30 years, followed the first two wars. The experience after the third may be similar.

[17] The new enterprises undertaken at the present high level, or projected, are many; among them, development and long distance transmission of hydroelectric power, and of electric power generated at the coal mines. Moreover, nearly every utility now existing must make expenditures upon its plant to provide improvements, additions, or extensions. The growth of our communities, and increase in the demands of the individual, constantly compel enlargement of a utility's facilities.

The present annual investment in public utility enterprises is much greater in amount than at any time in the past. Some of the construction done during the war was at prices for labor and materials 120 per cent above those prevailing in 1914. Recent construction was at prices 70 per cent higher. If replacement cost should become the measure of the rate base, the return on enterprises entered upon after 1914 would, obviously, be imperilled. And a serious decline of the price level would subject the return on many utilities established earlier to like dangers. A collapse of public utility values might result. And the impairment of public utility credit might be followed by the cessation of extensions and new undertakings.

vested in the near future, may be more, as it may be less, than the prevailing rate of return required to induce capital to enter upon like enterprises at the time of a rate hearing ten years hence. To fix the return by the rate which happens to prevail at such future day, opens the door to great hardships. Where the financing has been proper, the cost to the utility of the capital, required to construct, equip and operate its plant, should measure the rate of return which the Constitution guarantees opportunity to earn.[18]

The adoption of the amount prudently invested as the rate base and the amount of the capital charge as the measure of the rate of return would give definiteness to these two factors involved in rate controversies which are now shifting and treacherous, and which render the proceedings peculiarly burdensome and largely futile. Such measures offer a basis for decision which is certain and stable.

The rate base would be ascertained as a fact, not determined as matter of opinion. It would not fluctuate with the market price of labor, or materials, or money. It would not change with hard times or shifting populations. It would not be distorted by the fickle and varying judgments of appraisers, commissions, or courts. It would, when once made in respect to any utility, be fixed, for all time, subject only to increases to represent additions to plant, after allowance for the depreciation included in the annual operating charges. The wild uncertainties of the present method of fixing the rate base under the so-called rule of Smyth v. Ames would be avoided; and likewise the fluctuations which introduce into the enterprise unnecessary elements of speculation, create useless expense, and impose upon the public a heavy, unnecessary burden.

In speculative enterprises the capital cost of money is always high; partly because the risks involved must be covered; partly because speculative enterprises appeal only to the relatively small number of investors who are unwilling to accept a low return on their capital. It is to the interest both of the utility and of the community that the capital be obtained at as low a cost as possible.

About 75 per cent of the capital invested in utilities is represented by bonds. He who buys bonds seeks primarily safety. If he can obtain it, he is content with a low rate of interest. Through a fluctuating rate base the bondholder can only lose. He can receive no benefit from a rule which increases the rate base as the price level rises, for his return, expressed in dollars, would be the same, whatever the income of the company.[19] That the stockholder does not, in fact, receive an increased return in time of rapidly rising prices under the rule of Smyth v. Ames, as applied, the financial record of the last six years demonstrates. But the burden upon the community is heavy because the risk makes the capital cost high.

The expense and loss now incident to recurrent rate controversies is also very large. The most serious vice of the present rule for fixing the rate base is not the existing uncertainty; but that the method does not lead to certainty. Under it, the value for rate-making purposes must ever be an unstable factor. Instability is a standing menace of renewed controversy. The direct expense to the utility of maintaining an army of experts and of counsel is appalling. The indirect cost is far greater. The attention of officials high and low is, necessarily, diverted from the constructive tasks of efficient operation and of development.

The public relations of the utility to the community are apt to become more and more strained. And a victory for the utility may in the end prove more disastrous than defeat would have been. The community defeated, but unconvinced, remembers; and may refuse aid when the company has occasion later to require its consent or co-operation in the conduct and development of its enterprise.

Controversy with utilities is obviously injurious also to the public interest. The prime needs of the community are that facilities be ample and that rates be as low and as stable as possible. The community can get cheap service from private companies, only through cheap capital. It can get efficient service only if managers of the utility are free to devote themselves to problems of operation and of development. It can get ample service through private companies only if investors may be assured of receiving continuously a fair return upon the investment.

What is now termed the prudent investment is, in essence, the same thing as that which the court has always sought to protect in using the term present value.[20] Twenty-five years ago, when Smyth v. Ames was decided, it was impossible to ascertain with accuracy, in respect to most of the utilities, in most of the states in which rate controversies arose, what it cost in money to establish the utility; or what the money cost with which the utility was established; or what income had been earned by it; or how the income had been expended.

It was, therefore, not feasible, then, to adopt, as the rate base, the amount properly invested or, as the rate of fair return, the amount of the capital charge. Now the situation is fundamentally different. These amounts are, now, readily ascertainable in respect to a large and rapidly increasing proportion of the utilities. The change in this respect is due to the enlargement, meanwhile, of the powers and functions of state utility commissions.

The issue of securities is now, and for many years has been, under the control of commissions, in the leading states. Hence the amount of capital raised (since the conferring of these powers) and its cost are definitely known, through current supervision and prescribed accounts, supplemented by inspection of the commission's engineering force. Like knowledge concerning the investment of that part of the capital raised and expended before these broad functions were exercised by the utility commissions has been secured, in many cases, through investigations undertaken later, in connection with the issue of new securities or the regulation of rates. The amount and disposition of current earnings of all the companies are also known. It is, therefore, feasible now to adopt as the measure of a compensatory rate—the annual cost, or charge, of the capital prudently invested in the utility.[21] And, hence, it should be done.

Value is a word of many meanings. That with which commissions and courts in these proceedings are concerned, in so-called confiscation cases, is a special value for rate-making purposes, not exchange value. This is illustrated by our decisions which

[18]The community may, of course, demand, in respect to financing, as in respect to operation, that the right to earn a fair return be limited by the requirement that reasonable efficiency be exercised.

[19]Of course anyone who chances to have money to invest, when money rates are high, gets the advantage incident to investing in a favorable market. If he invests in utility bonds, the higher agreed return upon his capital would be provided for by a rule which measures fair return by capital charges, as suggested above. If he elects to invest in the stock, he would, under the rule suggested, have the opportunity of earning a return commensurate with the value of the capital at the time it was embarked as stock in the enterprise.

[20]Compare Mr. Justice Field in Railroad Commission Cases, 116 U. S. 307, 343, 344; Mr. Justice Harlan, ibid, p. 341; Dow v. Beidelman, 125 U. S. 680, 690, 691; and Reagan v. Farmers Loan & Trust Co., 154 U. S. 362, 409, 412; where the necessity of limiting the broad power of regulation enunciated in Munn v. Illinois, 94 U. S. 113, was first given expression. See also "Public Utilities, Their Cost New, and Depreciation," by H. V. Hayes, pp. 255, 256.

[21]In 1898, when Smyth v. Ames was decided, only one state—Massachusetts—had control by commission of the issue of securities by all public utility companies. (New Hampshire controlled security issues of railroads and street railways; Maine and New York controlled increase of capital stock by railroads; and Connecticut, the issue of bonds by railroads.) In 1923 at least 24 states and the District of Columbia controlled through commissions the issue of securities of public utility companies. Legislation for 1923 and 1922 (in part) has not been available. Other states may have legislated on the subject in 1923 or 1922.

In 1898 no state had control by commission of the accounting of all public utilities. Massachusetts controlled the accounting of gas, electric light, street railway, and railroad companies; Iowa, of railways and carriers; New York, Texas and Vermont, of railroads only. In 1923 at least 36 states and the District of Columbia controlled through commissions the accounting of public utility companies.

In 1898, only one state—Massachusetts—exercised through a commission control of all public utilities. In 1923 such control is exercised in at least 39 states and the District of Columbia. This does not include those states exercising commission control over railroads and related utilities, such as street railways, express companies, telephone and telegraph companies. These states number 47. The number of states having commission control of railroads in 1898 was 27. In 1922 every state except Delaware had commission control of railroads.

deal with the elements to be included in fixing the rate base. In Cedar Rapids Gas Co. v. Cedar Rapids, 223 U. S. 635, 669; and Des Moines Gas Co. v. Des Moines, 238 U. S. 153, 165, good will and franchise value were excluded from the rate base in determining whether the prescribed charges of the public utility were confiscatory. In Galveston Electric Co. v. Galveston, 258 U. S. 388, the cost of developing the business as a financially successful concern was excluded from the rate base. In Des Moines Gas Co. v. Des Moines, 238 U. S. 153, 171, the fact that the street had been paved (and hence the reproduction cost of laying gas mains greatly increased), was not allowed as an element of value.

But, obviously, good will and franchise value are important elements when exchange value is involved. And where the community acquires a public utility by purchase or condemnation, compensation must be made for its good will and earning power; at least under some circumstances. Omaha v. Omaha Water Co., 218 U. S. 180, 202, 203; National Waterworks Co. v. Kansas City, 62 Fed. 853, 865. Likewise, as between buyer and seller, the good will and earning power due to effiective organization are often more important elements than tangible property.

These cases would seem to require rejection of a rule which measured the rate base by cost of reproduction or by value in its ordinary sense.

The rule by which the utilities are seeking to measure the return is, in essence, reproduction cost of the utility or prudent investment, whichever is the higher. This is indicated by the instructions contained in the special report on Valuation of Public Utilities, made to the American Society of Civil Engineers, October 28, 1916, Proceedings, Vol. 42:

> So long as the company owner keeps a sum equivalent to the total investment at work for the public, either as property serving the public, or funds held in reserve for such property, no policy should be followed in estimating depreciation that will reduce the property to a value less than the investment, . . . (p. 1726).
>
> Estimates of the cost of reproduction should be based on the assumption that the identical property is to be reproduced, rather than a substitute property (p. 1719), —although such a substitute property, much less costly than the existing plant, might furnish equal or better service, it is not reproduction of service, but of property, that is under consideration; and clearly the estimate should be of existing property created with public approval, rather than of a substituted property (p. 1772).

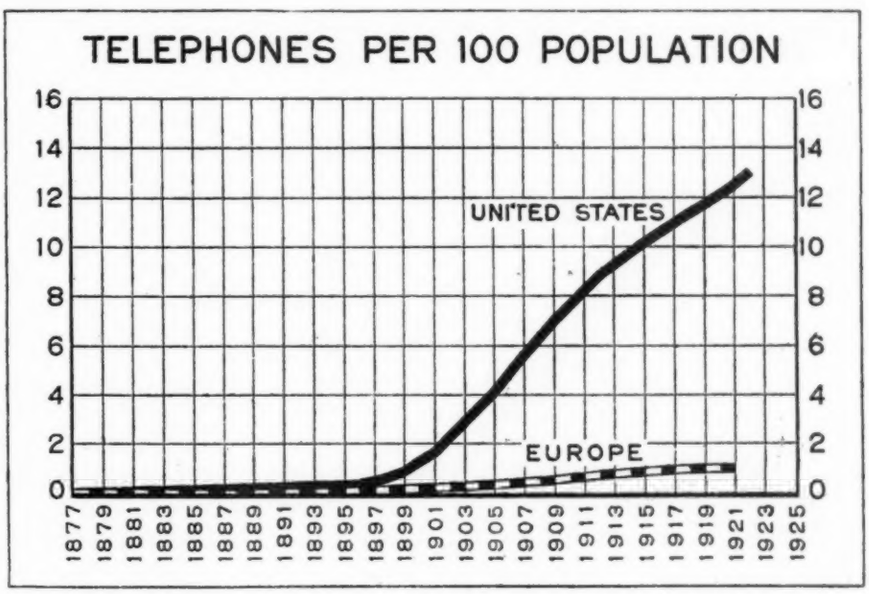
If the aim were to ascertain the value (in its ordinary sense) of the utility property, the enquiry would be, not what it would cost to reproduce the identical property, but what it would cost to establish a plant which could render the service, or in other words, at what cost could an equally efficient substitute be then produced.

Surely the cost of an equally efficient substitute must be the maximum of the rate base, if prudent investment be rejected as the measure. The utilities seem to claim that the constitutional protection against confiscation guarantees them a return both upon unearned increment and upon the cost of property rendered valueless by obsolescence.

Graphic Comparison Development of United States and Europe.

The best way to measure the relative extent of the development of telephone service in two places is to compare the population of each place with the number of telephones in use in that place. This has been done for the United States and Europe in the accompanying chart, which shows the number of telephones per 100 population from 1877 down to the latest date for which information is available.

The superiority of the telephone development of the United States over that of



Is Competition Responsible for This Difference in Telephonic Development?

Europe is clear. In proportion to population, there are ten times as many telephones in the United States as there are in Europe, and Europe today has succeeded only in making a point which was passed in the United States as early as 1900. In other words, telephonically speaking, Europe is 20 years behind the times.

Good Time and Beneficial Talks at Vermont Convention.

The program for the convention of the Vermont Telephone Association—which occurs June 28 and 29, at Burlington, with headquarters in the Hotel Van Ness—indicates that it's going to be an affair worth while going out of one's way to attend.

The convention will meet in the forenoon of Thursday, and after a brief session there will be a conference of managers and plant men, led by C. J. Knickerbocker, of the Granville Telephone Co., of Granville, N. Y. This will take place in the convention hall.

There will also be held, at the same time, in the reception parlor, an operators' conference in charge of Miss Lillian A. Vavasour, of Albany, N. Y.

So that everyone may be in attendance when the sessions open, the officers of the association urge that each person register early and secure a badge of identification and introduction.

Special papers are being prepared for the conferences, which will continue—with a brief intermission for lunch—until 4 o'clock.

At 4 o'clock there will be a demonstration of public address transmission, with prominent telephone men in Boston addressing the convention. This will be new to a Vermont audience and should not be missed.

It will be followed by a first aid demonstration, and a visit to the operating rooms of the local exchange.

In the evening, the New England Telephone & Telegraph Co. will be host at a banquet.

J. G. Ihmsen, of Albany, N. Y., vice-president and general manager of the Up-State Telephone Association of New York, will be one of the speakers at the Friday morning session. He is well known for his ability in association work and the Vermont men expect to get some valuable ideas from his talk.

At noon there will be a trip to Ethan Allen Park, where a picnic lunch will be served, after which there will be a ball game.

Secretary-Treasurer C. L. Ovitt, of Enosburg Falls, requests those who are going to attend to let him know so that preparations can be made.

Suggestion System of Co-öperation

Lincoln Telephone & Telegraph Co., Lincoln, Neb., Has Been Using "The Suggestion System" with Great Success—Plan for Securing Co-operation of Employes Adapted from Scheme Used by Large Industrial Organizations

The Lincoln Telephone & Telegraph Co. has been employing for nearly three months a system of co-operation with employes that has been markedly successful. It is an adaptation to the telephone business of a plan that has been developed in some of the large industrial organizations, and is called "the Suggestion System."

Briefly stated, it is a convenient method employed for the submission of suggestions by employes on all classes of improvements, the careful analysis and study of them by the supervisors of the organization, and their adoption in the most practical way, where this is found to be advisable. It also includes provision for the proper recognition of the value of the suggestion.

A form has been adopted for use in transmitting these suggestions. On this form, in a convenient place, are blanks which enable the management to keep a complete record of the progress of each one as it traverses the road of routine.

"We have adopted the suggestion system," said W. E. Bell, commercial superintendent, "as the best means of affording each and every employe a medium through which ideas may be submitted to the management, and to assure the proper receipt and disposition of them and to give proper credit for them.

"The opportunity is presented for the employe to exercise his initiative along the lines of constructive suggestion. Upon the enthusiasm and interest displayed depends the success of the system, and so far we have been greatly pleased with the result. We are trying to impress the employes with the fact that their development and progress means the development and progress of the company, and the proper appreciation of the opportunity means much in the future development of the individual employe as well.

"Our plan includes what we believe to be interesting features that will bring out ideas on improved methods, plans for the economical and efficient operation of our plants, and general suggestions pertaining to the successful conduct of our business."

CLASSIFICATION OF SUGGESTIONS.

Class A—Commercial Department.

1. Improvement in methods of commercial operation providing for a material decrease in expense or a considerable increase in revenue.

2. Improvement in commercial methods where a decrease in expense is effected, or an increase in revenue is realized, but where the improvement while valuable is relatively less important.

Class B—Plant Department.

1. Improvement in methods of operation, manner of doing work and design of equipment providing for increased safety of employes, decreased costs or more efficient operation.

2. Improvement in methods of operation, manner of doing work and design of equipment when such improvements are of considerable value but do not involve a material lessening of cost.

Class C—Traffic Department.

1. Improvement in method of operation, service conditions and reduction in cost of operation in those cases where the improvement is marked and considerable economy may be effected.

2. Improvement in operating methods and service conditions where the improvement is marked but does not result in material lessening of operating costs.

Class D—Auditing Department.

1. Improvement in methods and auditing systems when the improvement results in material economy or increased efficiency.

2. Improvement in methods and auditing systems in those cases where improvement is marked but does not result in any actual cost reduction.

Class E—General.

1. Improvement in general practices, changes in policy, and in matters pertaining to the convenience of employes, where no reduction in cost of operation is involved or any increase in revenue is anticipated.

SUGGESTION RULES.

1. No person directly connected with the disposition of a suggestion shall be given credit for such suggestion.

2. Suggestions may be forwarded by all employes in the organization, including general office and district supervisors.

3. Should more than one suggestion be received on the same subject, the one first received will be accepted and the others will be filed without action being taken, and the employe forwarding the suggestion will be so advised.

4. It is understood that the person making the suggestion receives credit for what he suggests, subject however to the foregoing rules.

5. The above rules are subject to modification by the suggestion committee, after all facts bearing on the particular case have been taken into consideration.

A suggestion system committee has been named and it has entire supervision of the operation of the plan. It is made up of one member from each of the commercial, plant, traffic and auditing departments, with a secretary. It receives the suggestions, classifies them, refers them to the proper departments, studies and analyzes the questions proposed, and recommends action to be taken. In short, it conducts all details of operation and attends to the proper functioning of the plan. District managers or others to whom suggestions on the prescribed form are made are required to forward weekly all suggestions they receive.

"We make it plain in our frequent bulletins that the ideas of any employe," said Mr. Bell, "whether they pertain to improvements in the service, methods of doing work or use of safety devices, improvement in equipment or design or for the betterment of our general plan of operation are welcomed. We encourage the men to send them in whether they think very much of them themselves, for frequently an idea that at first glance may look to have little value will prove really worth while after it has been studied from various angles by men who look at the business from different viewpoints.

"We recognize that the most discouraging thing to an alert, active-minded man or woman with ideas is to have his next higher in command—either out of failure to appreciate the idea or indifference or carelessness — treat lightly suggestions made to him. Usually, after two or three such experiences, the employe quits suggesting. We have now provided a system by which he not only need not consider himself or herself bound to speak first to a superior officer, but provide a channel through which their ideas go direct to a committee whose business it is to study the suggestion and to get expert opinion upon its value.

"We are trying to impress upon our

The New Ideal in Business.

The public utility industry has been revolutionized in its ethics and standards. Its ideal must be, and now is, SERVICE, and it is worth while devoting one's life to making this new ideal a reality to the people. There is a tremendous lot of fun in dealing directly and frankly and honorably with the people, and in striving to promulgate in the public utility world that state of mind which makes a man say, "What can I give?" instead of "What can I get?"—W. E. Creed, President, Pacific Gas. & Electric Company.

employes that the company is constantly looking for better and improved ways of doing things in all of its departments, and that it is aware that suggestions from employes are valuable because industrial history shows they have been important factors in the solution of both large and small problems. So we take steps to provide against any division of credit for good suggestions, and by providing a form upon which the idea may be outlined and which provides thereon for a report, insures him that whatever he has to submit will not pigeon-holed or lost, but will be given a respectful hearing."

For the purpose of further enlisting the interest of employes the suggestion committee sends out monthly a bulletin listing the suggestions sent in during the 30 days previous, the author, department concerned and the exchange.

The committee has adopted the policy of immediately acknowledging the receipt of a suggestion, and has gone further than the original plan of notifying the employe of the final action on it. It will use the regular bulletin as a means of keeping him advised of the status of his suggestion and at the same time advise other employes of the details.

Illinois Eight-Hour Bill for Women Abandoned.

Proponents of legislation to limit the hours of women in industry in Illinois decided late last week to abandon further efforts at this session of the Illinois general assembly.

Senate opponents of an eight-hour-day bill, which passed the house by a wide margin, succeeded in amending the measure to provide that the industrial commission fix the hours of female labor in all commercial lines of endeavor. Until the commission acts, a nine-hour day and fifty-six-hour week would prevail. This change was objectionable to senate leaders for welfare legislation.

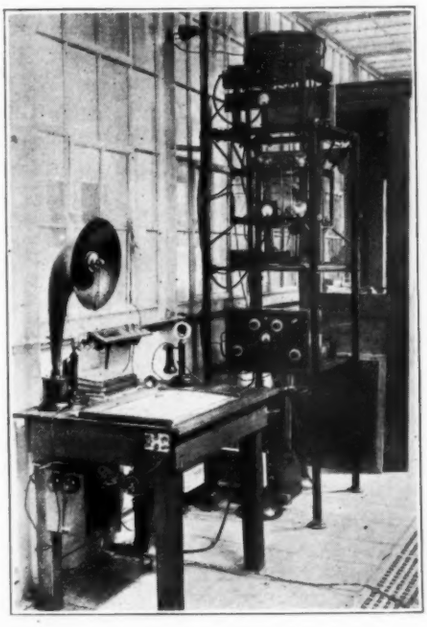
After an attempt on June 14 to suspend the rules and eliminate the industrial commission clause, which failed, it was decided to drop the fight. The bill remains on the calendar on second reading, but Senator Barr (Rep., Joliet) said no further move would be made in its behalf.

World's Longest Guided Radio Telephone and Telegraph.

The Pacific Gas & Electric Co. recently placed in operation the "World's longest guided radio telephone and telegraph system" between the Vaca-Dixon substation and Pit River power house No. 1, a distance of 202 miles. This system utilizes the twin circuit, 220,000-volt transmission lines between the two points for a conducting medium, a total distance of 202 miles, and will be for the sole purpose of directing the operation of the two stations, both under normal and emergency conditions.

The receiving equipment consists of a universal receiver which has been modified to make it a non-regenerative receiver, and a loud-speaking outfit using two stages of audio-frequency amplification.

One of the new and unusual features is the unique method of calling. This is accomplished by mounting a calling microphone in the horn of the loud speaker



Equipment Used in Experimenting with Guided Wire Radio.

which, when the calling circuit is completed, will oscillate and howl in much the same manner that the ordinary telephone will howl when the receiver is placed against the transmitter. This gives a very loud note, whose pitch will depend upon the natural period of oscillation of the diaphragms and is clearly audible in all parts of the station.

Ordinarily, it is not necessary to use the calling system as the receivers are always in service and the operator near the set so that the loud-speaker simply talks at him and he starts up his set and talks back. The system is arranged for simplex operation and all that is necessary is to operate a small telephone switch which energizes a contactor to connect either the transmitting or receiving set to the antenna, thus permitting talking or listening.

The system is coupled to the transmission line through a single wire antenna about 1,800 feet long. This wire is attached to the twin vertical circuit transmission towers at a point on the center line of the tower and at the elevation of the middle cross arm. Six suspension insulator units are used for dead-ending and supporting the antenna. The main station ground system is also used as a ground for the radio equipment.

The transmitting equipment is the vacuum tube telephone transmission equipment similar to that used by the high-powered broadcasting stations. Four 250-watt and one 50-watt Radio Corp. of America radiotron tubes are employed, two of the tubes being used as oscillators and two as modulators with the 50-watt tube as a speech amplifier.

The engineers of the company have no doubt as to its dependability even with one of the 220 kv lines down and grounded. They expect to effect communication between the stations under conditions when the wire lines will be out of service.

All of the experimenting and development work necessary to place the equipment in a satisfactory operating condition was done under the direction and supervision of Dr. L. F. Fuller, one of the foremost authorities in the field of radio activity. The accompanying illustration shows the temporary equipment during the experimental stage at Pit River Plant No. 1.

Federal Supreme Court Again Favors Reproduction Costs.

The United States Supreme Court on June 11 again declared in favor of reproduction costs as a factor in determining rates of public utilities. An order of the West Virginia Public Service Commission fixing rates of the Bluefield Water Works & Improvement Co. was affirmed by the Supreme Court of Appeals of West Virginia and taken to the United States Supreme Court, which reversed the state supreme court.

"The records clearly show," said Justice Butler in the federal court's opinion, "that the commission in arriving at its final figures did not accord proper, if any weight to the greatly enhanced costs of construction in 1920 over those prevailing about 1915 and before the war as established by uncontradicted evidence and the company's detailed estimated cost of reproduction new, less depreciation of 1920 prices, appears to have been wholly disregarded. This was erroneous."

Further on in the opinion Justice Butler observed: "The question in the case is whether the rates prescribed are confiscatory and, therefore, beyond legislative power. Rates which are not sufficient to yield a reasonable return on the value of the property used at the time it is being used to give the service are unjust, unreasonable and confiscatory and the enforcement deprives the public utility company of its property in violation of the Fourteenth amendment."

In affirming a decision of the District Court for the North District of Georgia, the United States Supreme Court, through Associate Justice Brandeis, in the case of Georgia Railway & Power Co. vs. the Georgia Railroad Commission, pointed out that consideration of reproduction costs of public utilities as well as of the original cost must be given in reaching a fair valuation of public utilities.

Sundry Snapshots Along the Trail

Observations and Comments, Pertinent and Otherwise, On the Sunshine and Shadows of Telephone Work

By Well Clay

I love to seek the quiet nooks
Of some drowsy woodland glen,
To watch the cares of other worlds
Not ruled by restless men.

The busy bee flies to its work,
Nor keeps nor cares for hours,
Intent only on the job it likes,
Of robbing wildwood flowers.

The thrifty ant its way betakes,
Nor stops for rest nor pleasure,
Content to add for good of all
Some mite to the common measure.

Each spider spins a silken web
And puts the deadly snare,
In some likely spot to catch
Some flying insect unaware.

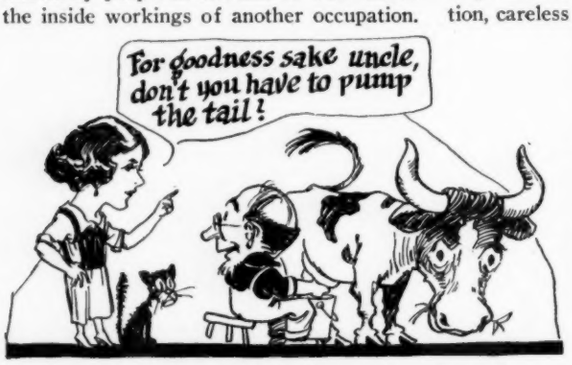
The nimble squirrel on leafy bough
Great things doth contemplate,
The cheerful cricket in the grass
Calls loudly to its mate.

Of each of these and others,
Few reck the world of man,
Each hath a horizon all its own,
Each measures by its span.

Conceiving not of other worlds—
That's saved for man alone—
Each follows an ordained career
The why to God only is known.

We are apt in our wisdom to look down on the insects, birds and beasts and, perhaps, feel a mite superior to them, for the reason that they are circumscribed in their vision so as not to be aware of other worlds and other spheres of life outside their own; but how much better off are we when we come right down to facts?

Even in our own lives among men it is often a source of wonder that so little is known by people in one line of work about the inside workings of another occupation.



She Had Never Thought Much About It, But Had an Idea They Took the Cow by the Tail and Pumped Out the Milk.

The little girl on her first visit from the city to a farm was amazed to see the cows milked. She never had thought much about it before, if any, but had a nebulous idea that they took the cow by the tail and pumped out the milk, the same as she had seen water gotten from a pump.

We are much the same and do not often stop to think of the technical side of the other fellow's job.

The conductor of the street car is human, when you stop to get acquainted with him, and not just a part of the machine that we are apt to get in the habit of considering him. The jeweler whom we see day after day sitting with a magnifying glass held like a monocle at one eye, intently peering into the inner works of watches, has an occupation very much different from ours, but he has the same drawbacks in it as we have in ours.

He is serving the public and, like the telephone man, if the machines he is fixing go wrong, then he gets kicks and criticisms, the same as we do when our machine—the exchange—goes wrong. When our watch goes wrong after having been repaired, we are quite apt to kick and condemn the watchmaker or the repairman without stopping to consider whether it is really his fault, the fault of the materials and workmanship of the watch itself or ours, due to the way we carry and use it.

The loss or gain of time may be traced to an imperfectly stamped balance wheel, just as an error of telephone service may be traced to an incompetent operator, a careless lineman, or an indifferent third party to the transaction. The watchmaker may do his best but a fault in the construction, careless handling by the owner, or extreme climatic conditions may make his efforts go for little at times.

We may do the same and wonder why the general public should not take the other factors into consideration when something goes wrong. At the same time we may unjustly condemn the watch repairman when our Ingersoll goes on the blink without ever stopping to consider that he is no more to blame than you are when you are asked to transmit through your exchange a message to some distant point via a series of grounded farm lines.

You may conscientiously try to do your best with the means at hand, and yet fail to give anything like a satisfactory service. You say: "If I only could have a clear, full metallic circuit all the way and good telephones and connections, there would be no trouble giving service; but how can the public expect service over such lines?"

It must be great to have dough, eat three squares a day, etc.
After all, he's the happy bird. No income tax or nothing to worry about

We Are All in the Same Game, Each with Handicaps and Blind to the Handicaps of Those in Other Occupations.

Then you go to your watchmaker friend and complain because your dollar watch has lost half an hour in a day or so. He might tell you: "If you would only get a good watch of a standard make and quit using it for a hammer to crack nuts, I could keep you out of trouble easily."

The automobile repairman has the same problem, so has the butcher, the baker and the golf stick maker. We do not stop to consider when we kick; if we did we would inquire carefully into the matter and then reserve our criticisms to a large extent.

The farmer might say the same thing as his brother in trouble, the watchmaker: "Give me a fertile soil, no drawbacks in the way of frost, bugs, hot winds, rust, scab, floods or blight, and I will show you a real service in the way of providing food supplies, if I can get the help cheaply enough and realize a better price.

Don't you see we are all in the same game, each with handicaps and to a large extent blind to the conditional handicaps of those in other occupations? We see, and understand fully, only those drawbacks which affect our own walks of life.

The "white" hearse driver at a colored folks' funeral is not apt to resort overmuch to the use of his pocket handkerchief, if you have ever noticed; but with his own color and family, it's different.

That is why we condemn the watchmaker so thoughtlessly at times while bemoaning the tendency of the public in their habit of picking flaws with the brand of service you are giving them. You know your own handicaps, but you don't stop to consider that the other fellow has any.

APHORISM: A slave is chafed only by his own collar.

Precedence of Long Distance Calls

A Practical and Helpful Form of Instruction Used in the Iowa Telephone Operators' Schools to Show the Relative Importance and Order of Each of the Five Different Classes of Toll Calls — Method of Presentation

By Miss Anne Barnes

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

The tableau, the words of which are presented on this page, makes a very interesting and instructive presentation of "Precedence of Calls." Miss Barnes used it in several of the Iowa operators' schools this spring and it proved very helpful to operators.

The tableau is presented as follows:

Average five chairs across the front of the room, placarded from left to right: "Class 1," "Class 2," "Class 3," "Class 4," "Class 5."

When each operator is to take her part on the program, she comes forward and stands behind the proper chair. She opens her talk with: "Good Morning," and then tells her story.

At the conclusion she advises her audience that she is ready to answer any questions which may be asked.

CLASS 1 ENTERS: "Good Morning! My name is 'Cut-Off.' You do not like me, I know. No one likes me—the company, the subscribers or the operators. And yet, I am the highest class call which travels over toll circuits.

"Why? I am rare, but that is not the reason. Well, it is because wherever or whenever a 'cut-off' on conversation occurs, connection must be re-established with as little loss of time as is possible. Therefore, an operator puts this work ahead of all other work on hand.

"When she says to any operator she meets out on the toll circuit. 'Cut-off,' these words act like magic. The circuit is open for my operator's use until she can get the parties who were talking into satisfactory conversation again. All other calls, orders and reports are held back to let me through, just as a fast train must have a clear track, and locals must wait.

"The reason the subscribers do not like me is because the connection has been broken in the midst, perhaps, of a business deal. Even when the connection is re-established, it is hard to continue where the conversation left off; in fact, there must be a little review of the subject under discussion. Thus, the subscriber loses, even though an allowance is made; besides, the telephone company often loses the confidence of this patron—perhaps, the next time, he will telegraph.

"The company can much better afford to lose the revenue than have a dissatisfied patron. You can see why the company does not like me. I am a revenue-loser and a confidence-loser.

"Of course, as soon as a conversation is 'cut-off,' the operator stamps off the ticket. But there is one situation in which she does not know immediately about a cut-off. That is when she has no *visual* supervision.

"In such a case, she must be sure to make enough allowance, and thus the company is likely to lose in the deal, for it is better that the company should lose than the subscriber should be penalized.

"No, there is no honor sitting in this Class 1 chair. I am humiliated by having to sit here today. But I wish you to ask me all the questions you want to. So if there is anything you want to know, ask me now!"

CLASS 2 ENTERS: "Good morning! My name is Appointment Call. I feel very sorry for poor old 'Cut-Off.' She is such a trial to, and makes so much trouble for, the company, operators and subscribers, that we all stand aside when we see her coming.

"I am next in importance. Do you know why? I will tell you:

"You see, if a man down at Hocum wants to talk to a man up at Hustleville at a specified time, the telephone company takes it for granted that there are particular reasons why he wishes to talk at that time and no other; besides he is willing to pay a higher rate, called appointment rate.

"This rate is just double the station rate. You see I come high but sometimes they have to have me. I have often heard operators say, and maybe someone is thinking, ' I don't see why Appointment Call should have a higher rate.' Well, I will tell you a few things.

"Did you ever stop to think of the work I require? When I start out, I am no more important than any other call—I must take my time with other calls requiring the circuit. But when we arrive, my operator must arrange the appointment with the distant party personally.

"Sometimes he is reported out. In such a case my operator cannot arrange with anyone else at the distant telephone to inform the desired party that the calling party wants him. No—my operator must just leave word for the desired party to call when he does return. When he returns he is told to call 'Hocum.' Then my operator has to arrange the appointment. If it is satisfactory, I wait in my proper compartment until five minutes before the time the parties arranged to talk.

"Now is the time that there is some class to me. I come right down on top of all of the tickets on the keyshelf, and I am *first out* on a circuit. If we meet any other operators on the circuit, my operator just mentions my name—and I get right of way over that circuit faster than the president of the company could.

"Can't you see my value *now* over other calls? And can't you see why that man who is willing to talk at a specified time must not be delayed?

"Here is an important fact: If that connection cannot be established within half an hour after the appointed time, and the fault is not the patron's, the telephone company cannot charge that high rate—after all of the work I have caused and the loss of circuit time.

"If you want to know anything more about me, ask me!"

CLASS 3 ENTERS: "Good morning! I see by your faces that you are glad to meet me—operators always are, as my name is 'WH.'

"The definition of my name means 'Ready'—ready to establish a conversation on a call which has experienced a delay previously; ready to deliver the goods; ready to make circuit time revenue bearing.

"Don't you think I deserve to belong in Class 3? That means that I usually belong on top of the delayed pack on the keyshelf. It means that, no matter what the operator has on hand—unless she has a cut-off to establish, or the completion of an appointment at the appointment time—if she has an available circuit she is going to start me quickly toward the originating office. If she meets any other operator on the circuit who challenges her right to the circuit, she is going to say. 'Mine is WH.'

"If you want to ask me any questions, do so!"

CLASS 4 ENTERS: "Good morning! We three belong to Class 4. You operators have been much better to us this last year than ever before. Now, since it has become ancient history, I can speak of it and no one will take offense. I will introduce ourselves:

"This is 'Miss Next Call Attempt to Secure a Busy Line.' Some distant operator has left a call order for a 'by' number at this office.

"This is 'Miss Next Call Attempt to Secure a Number Reported DA,' and a distant operator left a call order here.

"I am 'Miss Later Attempt to Reach a Calling Party for Whom Word has been Left.'

"We have long names, but what's in a name? We do not involve the use of a toll circuit until some kind of a report is gotten after the operator makes this subsequent attempt. Now I told you that you formerly did not treat us as well as you do now. It was like this:

"When that busy distant operator left you the call order, she had faith that she would hear from you at a certain time if you could *possibly* get back to her. She also knew that she must allow you a certain number of additional minutes, and then she could come back to you and make inquiry about her call order—one of these call orders here.

"When the time arrived to take up Called Party's line and to make an attempt to complete the distant operator's call, you first slipped in a call or two of your own. You knew she was so far away that she would never be the wiser.

"Now what might have happened if you had played square? You likely would have turned those 'BY' or 'DA' call orders right into 'WH' reports—and 'WH' has told you how important she is. So you see you must watch us 'Next Call Attempts.' We often 'bring home the bacon.'

"If you want to know anything more about us, ask us now!"

CLASS 5 ENTERS: "Good morning! You see there are four of us who belong to Class 5. Here is Miss New Call. She has never been away from home yet. This is Miss 'Ag on an Lw.' Rather a long name isn't it? Just because she has been clear to her destination one or more times doesn't make her one bit less important than Miss New Call. Some of you used to think so.

"Don't you remember, when an operator challenged you, you would say 'Mine is a new filing. Is yours an Ag?' You wouldn't think of doing that now, would you?

"Here is 'Miss Aging a Call Order.' It looks as though some operator has forgotten her. I hope not.

"I am Miss 'Delayed Report to Pass.' I really do not get anyone anywhere—but I do make a subscriber feel better toward the company, if I travel to him, for he then knows the operators are working on his call.

"If you want to know anything more about us, ask us, please."

Wisconsin Association Will Hold Mid-Summer Meeting.

The mid-summer meeting of the Wisconsin State Telephone Association will give both benefit and enjoyment to those who attend. It will be held Friday and Saturday, June 29 and 30, in LaCrosse.

Among the important topics coming up for discussion at the meeting are the application of the new electrical code of Wisconsin; the securing, through co-operative effort, of insurance covering compensation, public liability, and pensions, for companies which are not now able to secure all those forms of insurance.

There will also be a conference for the operators, at which there will be talks on traffic matters and suggestions for operators in small exchanges.

On the entertainment program is a boat ride on Saturday afternoon. As LaCrosse is ideally located in a territory unsurpassed for natural scenic beauty, the trip is certain to prove enjoyable.

Secretary J. A. Pratt of the association points out that this is a good opportunity to travel to LaCrosse by an automobile, and that state trunk highways 11, 12 and 33 all lead to that city.

He invites all telephone companies to send as many representatives as possible.

New York Operators' Conference Full of Interest.

Forty-three operators were present at the district conference of operators of the Up-State Telephone Association of New York held in Wellsville, June 4, in the Odd Fellows' rooms. It was a most successful meeting in every way. Delegates were present from numerous offices not only in Allegany county but Cattaraugus and Steuben as well, representing these organizations: Allegany County Telephone Co., Allegany Mutual Telephone Co., Cattaraugus Union Telephone Co., Fillmore Telephone Co., Friendship Telephone Co., Greenwood Telephone Co., and Whitesville Telephone Co.

Upon arrival the delegates were registered by Mrs. Thelma Walker and the morning session convened promptly. Miss Lillian A. Vavasour gave a short address setting forth the aims and purposes of the meeting, after which the fundamentals of good local service were carefully gone over and demonstrated by practice drills participated in by the delegates generally.

The details of ringing subscribers properly, enunciating distinctly, and correctly adjusting transmitters were discussed and their importance as direct aids to good service emphasized.

The best method of recording complaints was another subject of discussion and the importance and desirability of a prompt and satisfactory adjustment of them with subscribers was dwelt upon.

A special feature of this session was an address by Miss White, Traveling Chief Operator, Buffalo suburban, on repetition, enunciation and voice expression.

At one o'clock an adjournment was taken for dinner which was served by the ladies of the Rebekah Lodge with the compliments of the Allegany County company.

The afternoon session immediately after coming to order proceeded to a consideration of operating practices used in the handling of toll calls. A special talk on this branch of the work was given by Miss White, which was most instructive and was followed with particular attention by the delegates.

Her subject dwelt on the proper routing, and rating of long distance calls. At its close the different steps involved were performed under her direction by various operators selected at random from the audience.

The offices participating in this conference, with their representatives, were:

Andover, Mrs. Edna Langworthy; Angelica, Mrs. Gibson, Mrs. Helmer; Belfast, Mrs. Coons, Miss Bucheister; Belmont, Miss Colligan, Mrs. Brooks, Mrs. Rice; Bolivar, Miss Reynolds, Miss Moses, Miss Skerritt, Miss Perry; Buffalo, Miss White; Cuba, Mrs. Lewis, Miss France, Miss Herrick, Miss McGraw; Ellicottville, Miss Holloran; Fillmore, Mr. and Mrs. Harris, Miss Stone, Miss Wheeler; Franklinville, Miss Kingsbury, Miss Williams; Friendship, Miss Doran, Miss Hickcox; Greenwood, Mrs. Youngs, Miss Waters; Hornell, Miss Hennessy; Olean, Miss Houghton; Rushford, Miss Cole; Salamanca, Miss Murrin; Wellsville, Miss Gonter, Mrs. Walker, Miss Connell, Miss Tanner, Miss O'Connell, Miss Gardner, Miss Hathaway, Miss Leonard, Miss McHale, Miss Stoll, Miss Perry; and Whitesville, Mrs. Ainsworth.

The Cuba conference on May 18 and the one at Wellsville were the first two meetings of the series inaugurated by the Up-State Telephone Association of New York during the current year and are the only ones that are planned for that immediate section of the state. The Allegany County Telephone Co. was selected to initiate the series and, aside from the honor thus conferred upon it, feels a genuine satisfaction in its efforts to improve the telephone service through the agency of these meetings.

Illinois Bell $50,000,000 Bond Issue Goes on the Market.

The $50,000,000 bond issue of the Illinois Bell Telephone Co. has been placed on the market.

The bonds are to run 33 years and are offered at 95¼ to yield 5.30 per cent. They are secured by a first mortgage on all property owned by the company, appraised at more than $133,000,000, according to the statement of the company.

Proceeds from the bonds will be used to the extent of $19,000,000 for refunding the issue of Chicago Bell Telephone Co. bonds assumed by the Illinois Bell company; $15,000,000 for refunding an issue of American Telephone & Telegraph Co. bonds also assumed by the Illinois Bell; and $16,000,000 as new capital. The new bonds will mature December 19, 1956, and are callable at 105 after 1929.

Commissions, Courts and Councils

Discussion and Rulings of State Bodies Having Supervision Over Telephone Companies—Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchise, Rates and Service

Indiana Company Moves to Halt Power Line Construction.

The Citizens Independent Telephone Co., of Terre Haute, Ind., filed an application in the circuit court, June 5, for an injunction against the T. H. I. & E. Traction Co., asking that the latter be restrained from erecting a high tension line in the Maple Ave. road from Terre Haute to the traction substation at Seelyville.

The injunction is asked on the grounds that the erection of the line would render totally ineffective the telephone company's line in the same road, causing damage to the extent of $25,000.

According to the complaint, the traction company contemplates the erection of a high tension line carrying 66,000 volts and plans to abandon the present high tension line in the Fort Harrison road. The complaint also states that the work of erecting the poles has been started.

The telephone company declares that the new power line would render ineffective the telephone line to Seeleyville.

Illinois Farmers Mutual Company Asks Leave to Quit.

Authority to discontinue operating its service and to sell what equipment it owns, is asked for by the Farmers' Mutual Telephone Co. of Pike county in a petition filed with the Illinois Commerce Commission June 8. The owner is George W. Van Gundy of Bluffs, Scott County.

The company states that there is no demand for its services and that it has discontinued operation. It served a number of localities in Pike County.

Resume Hearings on Rates of the Illinois Bell in Chicago.

Considerable documentary evidence regarding the corporate articles of the Illinois Bell Telephone Co., was submitted by the city of Chicago, June 13 and 14, at a resumption of the hearings in Chicago before the Illinois Commerce Commission on the present rates of the company.

The attorneys for the city attempted to show that profits from allied industries, including the Western Electric Co., should be taken into consideration when the commission was considering the finances of the telephone company.

Several officials of the Western Electric and the American Telephone & Telegraph companies were placed on the stand during the hearing and were cross-examined as to the corporate relations of the companies.

Attorneys representing the city contended that more than 98 per cent of the stock of the Western Electric is controlled by the A. T. & T., and that fair prices are not set upon the material sold by the Western Electric, as all the profits go to the A. T. & T.

The 4½ per cent contract with the parent company was also attacked by the city's representatives.

Action Started Against New England Bell by "Common People."

A petition asking that the New England Telephone & Telegraph Co. be required to establish a one-cent-a-call schedule to replace the present contract system, has been filed with the Massachusetts Department of Public Utilities by Attorney A. P. Connor, representing the Common People, "an incorporated organization having in view better political and civic conditions." The hearing is set for June 26.

It is also asked in the petition that the company be ordered to reduce the salaries of its chief executives, and to discontinue the payment of the 4½ per cent to the A. T. & T. Co.

Court Says Mississippi Must Go Back to Lower Rate Schedule.

The motion of the Cumberland Telephone & Telegraph Co. to dismiss a writ of certiorari granted the attorney general of Mississippi, May 21—by which the Cumberland company was ordered to reduce telephone rates to the scale prior to January 1, 1923—was denied on May 27 by Judge Wiley Potter of the circuit court.

Judge Potter, in overruling the motion of the company, said that in his opinion the order of the Mississippi Railroad Commissioners was void, and that the company cannot legally collect the increase granted by the order.

"Dark Horses" Appointed to Missouri Service Body.

Thomas J. Brown of Charleston, Mississippi county, and R. H. Musser of Plattsburg, have been appointed members of the Missouri Public Service Commission by Governor Hyde.

Mr. Brown, a Republican and a member of the constitutional convention, was named to succeed Noah W. Simpson, of Labelle, Democrat, for a term ending April 15, 1929. Mr. Musser, a Democrat, was appointed to succeed the late Hugh McIndoe, Republican, of Joplin, for a term ending April 15, 1925.

Neither of the new commissioners has figured prominently in state politics, although Mr. Brown has been a member of the constitutional convention since May, 1922. He has been active in Republican politics in Southeast Missouri, and was tendered an appointment in the state insurance department by Governor Hyde last year, but declined. The appointments of the two men are effective immediately.

The term of Andrew J. O'Reilly of St. Louis expired April 15, but the governor has not announced when he will fill the place.

K. C. Long Distance Authorized to Sell Missouri Properties.

Approval was given on June 15 by the Missouri Public Service Commission to the transfer by the Kansas City Long Distance Telephone Co. to the Kansas City Telephone Co. of the local telephone properties serving Excelsior Springs, Richmond, Norborne and surrounding rural communities.

The consideration mentioned in the order is $225,573, which is to be paid on or before January 1, 1925, with interest at the rate of 6 per cent from April 1, 1923, payable semi-annually on the 15th day of June and December of each year.

Commission Asked to Settle Dispute Regarding Poles.

The Columbus Railway & Light Co. has asked the Ohio Public Utilities Commission to intervene and settle a dispute it has with the Ohio Bell Telephone Co., Western Union Telegraph Co. and the American Telephone & Telegraph Co. over the building of a power line on the national highway from Bexley into Hibernia.

The Railway company, according to the application, has made an agreement with the Columbus, Newark & Zanesville Electric Co. to use its poles and has a franchise from the Franklin County commissioners for the power line. The telephone and telegraph companies, however, have all the available pole space, and it has been found impossible to reach an agreement relative to erecting higher poles for the power line, in accordance with power line regulations of the commission.

Propose Abolishing Oklahoma Corporation Commission.

Initiative petitions were filed June 8 with the secretary of state in Oklahoma having for their purpose an amendment to the state constitution abolishing the Oklahoma Corporation Commission. The

Keystone Telephone Company's Main Office, Philadelphia

STATEMENT OF EARNINGS OF KEYSTONE TELEPHONE COMPANY

	For twelve months ending Dec. 1922
Gross earnings	*$1,703,274*
Operating expense and taxes	*977,681*
Net earnings	*$ 725,593*
Less interest charges	*501,235*
Balance available for dividends, surplus and reserve	*$ 224,358*

hat Strowger Automatic Has Done for Keystone

it can do for your company too.

If the installation of Strowger Automatic equipment did nothing more than permit the rendering of a completely satisfactory and up-to-date telephone service, any company would be justified in adopting it.

But besides the furnishing of a uniformly satisfactory service to the user, Strowger Automatic can and ***does*** increase the profits of the company operating it. For example, just glance at the table on the opposite page, showing the statement of earnings of the Keystone Telephone Company for 1922. It is interesting to know that while the gross revenue of this company has increased less than 3% since 1919, ***the net profit has increased more than 14%.***

To improve service is worth while. To increase profits is better. Strowger Automatic does both for Keystone, and ***can*** do both for you.

Let us show you how to do both,—now.

Automatic Electric Company

FACTORY AND GENERAL OFFICES: CHICAGO, ILLINOIS

BRANCH OFFICES IN ALL PRINCIPAL CITIES

ASSOCIATED COMPANIES

INTERNATIONAL TELEPHONE SALES AND ENGINEERING CORPORATION, New York

International Automatic Telephone Company, Ltd. London

Compagnie Francaise pour l'Exploitation des procédés Thomson-Houston Paris

Automatic Telephone Mfg. Co., Ltd., Liverpool

Automatic Telephones, Australasia, Ltd., Sydney

movement is backed by the Farmer-Labor-Reconstruction League and the farm labor group which is active in all departments of the state administration.

The proposed amendment would substitute for the corporate commission a commissioner of railroads and warehouses who would be elected for four years, the present governor to appoint, however, for the interim, which would mean the period expiring with the Walton administration. The proposed commissioner would receive a salary of $5,000 a year.

The companion proposal would limit the legislature to an appropriation not to exceed $75,000 a year for maintenance of the department. The movement is headed by Tom Latham, of Cleveland, who has opened headquarters in Oklahoma City. His argument in support of the project is that it would greatly reduce the financial outlay necessary in the regulation of railroads and such other business as might still be regulated.

Citizens Think They Should Share Cost of Improvements!

The Garber Telephone Co., of Garber, asked the Oklahoma Corporation Commission on June 14 to authorize an increase in rates for business and residence service.

The application is endorsed by city and chamber of commerce officials of Garber. Municipal improvements of extensive character, including street paving, are necessitating removal of the telephone lines from the streets to alleys and underground conduits and the citizens take the position that they should share with the telephone company the financial burden involved in this development.

E. E. Mills is president and general manager of the company.

Deerfield, Wis., Company to Issue $3,320 Capital Stock.

A capital stock issue of $3,320 was authorized for the Deerfield Telephone Co., of Deerfield, by the Wisconsin Railroad Commission on June 2.

The issue is divided into 332 shares of par value of $10 each, and is to be sold for cash and at not less than its par value. The funds are to be used to pay for additions and extensions to its property and plant.

The company is required to file with the commission, within 30 days after the sale of the stock, a verified statement showing the proceeds, and later, a statement showing how the proceeds have been applied.

Wisconsin Company Complains of Bell Long Distance Service.

Telephone service between Grant County, Wis., and points outside of the state was discontinued over the lines of Farmers' Telephone Co. on May 1, when complaint was filed by the board of directors of that company with the Interstate Commerce Commission at Washington regarding the manner in which the Northwestern Bell Telephone Co. was handling long distance calls routed over its lines. Officials of both companies and business men of the locality held a conference but the situation has not been altered.

Must Obey City Ordinance Regarding Placing Telephone Poles.

An ordinace required telephone poles to be placed within or adjacent to the curb line of the street. The fact that the curb line and property line of an alley were the same, and that to place the poles adjacent to the curb line would cause cross-arms to extend over private property, is no justification for the company to set its poles out in the paving 2½ feet from the curb line.

The company may either construct its cross-arms to extend from one side of the pole only, or procure from private owners the right or permission for the overhang of cross-arms over their property.—Harris vs. Central Power Co., Supreme Court of Nebraska, 191 Northwestern, 711.

Duty of Illinois Commission to Establish Fair Rates.

While the Illinois Commerce Commission has no authority to makes rates for a public utility in the first instance as the right lies with the utility—the commission, in order to prevent unjust discrimination, undue preferences, and extortionate rates and charges, is charged with the duty of establishing just, reasonable, and uniform rates.

In a hearing it is the commission's duty to establish the rates or the charges, classifications, contracts, practices, rules, or regulations proposed, in whole or in part, or others in lieu thereof, which it shall find to be just and reasonable. Illinois Bell Telephone Co. vs. Illinois Commerce Commission; Supreme Court of Illinois, 137 Northeastern, 449.

Summary of Commission Rulings and Schedule of Hearings.

INTERSTATE COMMERCE COMMISSION.

June 2: Application filed by the Chesapeake & Potomac Telephone Co. of West Virginia for authority to purchase, for $5,000, certain properties of the Trap Hill Telephone Co. located at Beckley and elsewhere in West Virginia.

ILLINOIS.

June 8: Petition for authority to establish a schedule of increased rates filed by the Auburn Telephone Co., of Auburn.

June 8: Application filed by the Farmers Mutual Telephone Co. of Pike County for authority to discontinue doing business and to sell its equipment.

June 13-14: Hearings resumed in Chicago on rates of the Illinois Bell Telephone Co. for service in that city.

June 19: Hearing held at Springfield on application of the Canton Home Telephone Co. for increased rates for service in Canton.

June 19: Hearing held at Springfield on petition of W. J. Rossilott for an order requiring the Commercial Telephone & Telegraph Co. and the Independent Telephone Co. to establish physical connection between their lines serving the northern and southern parts of Gallatin County.

June 20: Hearing held at Springfield on application of the Illinois Bell Telephone Co. for an advanced rate schedule for service in Alton and Wood River.

June 20: Hearing held at Springfield in the matter of proposed advance in the rates of the Illinois Bell Telephone Co. in Edwardsville and vicinity.

June 20: Hearing held at Springfield on petition of the Commercial Telephone & Telegraph Co., of Olney, for higher rates for service in Norris City, Galconda, Shawneetown, Ridgeway, Equality and Elizabethtown.

June 20: Hearing held at Springfield on petition of the Citizens Telephone Co. for authority to execute its deed of trust to secure an issue of $250,000 of its first mortgage bonds, and for permission to issue $200,000 of the bonds.

INDIANA.

June 5: Hearing held in Indianapolis on application of the Harrison County Telepnone Co., of Elizabeth, for increased rates.

MASSACHUSETTS.

June 26: Hearing to be held in Boston on petition of A. P. Connor, representing an organization known as the "Common People," for an order requiring the New England Telephone & Telegraph Co. to establish a new schedule, reduce the salaries of its officers, and discontinue payments under the 4½ per cent contract with the American Telephone & Telegraph Co.

MISSOURI.

June 15: Authority given the Kansas City Long Distance Telephone Co. to transfer certain of its properties to the Kansas City Telephone Co.

NEBRASKA.

June 12: Complaint filed by McCaull-Dinsmore Company of Omaha against the Northwestern Bell alleging that the company insists upon holding complainant liable for long distance charge made by an employe from another station than that in complainant's office.

June 13: In the matter of the application of the Ames Creek Telephone Co., of Obert, serving 150 stations, for permission to increase rates; it appearing that the revenue needs of the company require a larger income, it is ordered that certain rates be increased 15 per cent, to apply to business and farm stations, the rate for the former to be $2.30 a month, and for the latter $1.15 a month.

June 21: Hearing at Arapahoe upon the application of the Arapahoe Telephone Co. for permission to issue additional stock.

OHIO.

June 7: Petition filed by the Columbus Railway & Light Co. asking commission to settle dispute with Ohio Bell Telephone Co., Western Union Telegraph Co. and American Telephone & Telegraph Co., relative to pole space.

June 18: Hearing held in Columbus in the matter of rates of the Ohio Bell Telephone Co. for service in Dayton; witnesses for the city of Dayton cross-examined by attorneys for the company.

June 25-26: Hearings to be held in Columbus in the matter of increased rates in Akron for service by the Ohio Bell Telephone Co.

OKLAHOMA.

June 14: Application for increased rates filed by Garber Telephone Co., of Garber.

Here and There in Telephone Work

Whose Job Is the Biggest?

By Layton E. Meadows.

It is a commendable ambition that prompts the desire to do big things. We all of us do or should, aspire to places of great responsibility. The way to realize that ambition is to make of the jobs we have the very biggest and greatest jobs in the world. Learn to do well the things your hand finds to do.

The fellows who make themselves indispensable are in the direct line of promotion and, consequently, of greater power and influence. The trouble with many of us is that we are inclined to begrudge the time and effort devoted to the necessary period of trial and apprenticeship. The top of the ladder is not reached in a day.

We all hope, perhaps, to some day emerge full-winged and well-equipped from the preparatory school of life, ready to accept large responsibilities. Doubtless when we step forth we are prepared for this, but we should remember that the opportunity given, no matter how seemingly unimportant in this great organization of ours where we find ourselves, is one of great responsibility.

As we make of our present job the biggest and most important job in the company, we prove our readiness to advance. Our position may not be regarded by everybody as the most important in the big scheme which is being made to function harmoniously, but it is the most important to ourselves because in it we are proving to ourselves the faith which is within us.

Look about you, if you will, and you will discover one fellow doing line work, one installing, one a laborer. It matters not if he is fitted for this seemingly unimportant work, he is making of his job the biggest job in the organization. He takes justifiable pride in doing well the task which is his.

The rule is universal in its application. We get out of our job only what we put into it; and it is satisfying to remember, our own prejudices and complaints to the contrary, that we actually get all that we do put in. As there are exceptions to all rules, so there probably are exceptions to this, but it may be stated as a general proposition that those who complain of inadequate rewards are those who have failed to realize the importance to themselves of the jobs which they have undertaken.

There is a man in San Francisco who claims to have the biggest job in our company. He has. We telephone people are inclined to believe that the president of the A. T. & T. Co. has the biggest job. He has.

To them their jobs are the biggest because they are trying to do their work better than anybody else has ever performed tasks similar to those they have undertaken. Your job is the biggest and everyone else's is the biggest also—but this is true only as we, too, try to do our particular tasks better than they ever have been done before.

Missouri Company's Employes Have Quarterly Meetings.

An illustration on this page shows some of the employes of the Missouri Union Telephone Co., of Clinton, Mo., who took part recently in one of their quarterly conferences.

Group of Employes of Missouri Union Telephone Co., Who Gathered in Conference Recently at Clinton, Mo.

These meetings, held every three months, prove exceptionally helpful and a great deal of interest is taken in them. Problems which come up between meetings are discussed and viewpoints presented on various matters having to do with furnishing telephone service.

The Missouri Union company was organized in April, 1899, and now has seven exchanges—Clinton, Windsor, Calhoun, Deepwater, Montrose, LaDue and Urich. It operates 4,300 stations.

Employes' Meetings at Moultrie, Ga., Develop Loyalty.

An employes' meeting every once in a while—one that combines the business with the social side of life—is an excellent way to develop a spirit of loyalty and coöperation.

That has been the experience of the Consolidated Telephone & Telegraph Co., of Moultrie, Ga., and one of the very perceptible results of this coöperative spirit was a percentage of 97.6 on collections for 1922.

The last meeting was held June 7 at Moultrie, at which there were present at least two employes from each of nine exchanges. The main part of the program was in the afternoon, following luncheon at the Russell Hotel.

After the talks by the employes, the president and the general manager, there was an automobile trip to a beautiful place in the "piney woods" where there is a lake, so that swimming and games made the afternoon pass quickly.

In the evening the crowd gathered around a large camp fire, and a basket supper was served. It was such an enjoyable affair that everyone was reluctant to go home, tired as he was.

The following informal talks were made at the conference:

"Effectiveness of Our Organization and What We May Accomplish in the Future," B. Y. Chambers, general manager, Moultrie.

"Proper Supervision of Toll Lines," Miss Eunice Hiers, toll supervisor, Moultrie.

"Service from a Plant Man's Standpoint," S. M. McCarty, manager, Boston.

"Satisfying the Public," Miss Ida Cone, chief operator, Barwick.

"What I Think of the Telephone Business," W. A. Pringle, president, Thomasville.

"Proper Discipline Essential to First Class Service in Operating Room," Miss Jewel Hester, assistant chief operator, Moultrie.

"Proper Use and Care of Central Office

Equipment," W. A. Lowder, superintendent, Moultrie.

"Handling Collections," Mrs. Allene Hester, cashier, Moultrie.

Extension of French Telephone System Urged at Conference.

At meetings during The Posts, Telegraph and Telephone Week, there was considerable criticism of those services in France, more especially of the telephone service, says a report from Commercial Attaché C. L. Jones, Paris, to the U. S. Department of Commerce.

Discussions indicated that the government appreciates the necessity for marked improvement in the service. Responsible officials commented very severely on the inferior service rendered by the telephone system. Toll lines were said to be so unsatisfactory that they may be said to be hardly a factor in communication in France. Rural service is in its infancy. Other speakers commented on the fact that the telephone was an instrument of everyday use in the United States and an item of luxury in France.

At the end of the sessions the conference expressed itself in favor of: (1) the replacement of aerial wires by cables in interurban service at the earliest possible date; (2) the installing of automatic telephone service; and (3) the development of the telephone service in the country through the organization of small coöperative companies.

The government has put before parliament a comprehensive plan for the development of the French telephone service involving the expenditure of 200,000,000 francs per year for ten years on new equipment.

The pledging of an amount so large as this under the financial conditions now obtaining in the republic has given rise to considerable comment. The plans received, however, the hearty support of all those in attendance at the conference, because of the great importance which the telephone should have in the economic life of the country. The bill authorizing the expenditures has passed the Chamber of Deputies and is now in the hands of the senate finance committee.

Unexpected Source of Trouble Found in "Buried" Cable.

Telephone companies that practice laying bare cable in the ground have more than a tile-man's spade and the elements to fear. The accompanying photograph shows a gopher who sharpened his teeth on the cable laid underground by the El Paso Telephone Co., El Paso, Ill.

He had built a nest right over the top of the cable and evidently took the 15-pair cable for a root of some tree and tried to cut it, but abandoned his purpose when he discovered he was interfering with public service.

The company had an interesting time discovering the cable trouble which came in shortly after a rain. At first it was thought to be in the aerial cable but it was soon discovered that it was underground.

As there had been no digging along the underground cable route, the troublemen were at a loss to account for the trouble.

By the use of a coil and tone test the

This Gopher Interfered with Public Service in El Paso, Ill., When He Was Engaged in "Underground Construction" Work.

approximate location was found and after digging down to the cable and following along it for a few feet, the gopher's nest was found and likewise the damaged cable. The illustration shows that both the trouble and its cause were removed.

Filter System Applied to Radio to Secure Secrecy.

One problem of radio telephony—privacy of conversations—has been solved by engineers of the Bell system, according to a recent announcement by the American Telephone & Telegraph Co., which reported that the invention was working successfully over a 30-mile stretch of ocean between Los Angeles and Catalina Island.

Secrecy for the "phantom wire," said the engineers, had been accomplished through an invention which "scrambles" the conversation at one end and "unscrambles" it at the hearer's end. The radio-telephonic talk is just a jumble to any one else who "listens-in" on the same wave length.

"The wireless 'talk bridge'" said an engineer of the company, "which has given telephone service across the 30-mile gap of water, was designed and installed in 1920 to permit two-way talking between the mainland and the island. It has given satisfactory transmission day and night throughout the year.

"At the time the radio apparatus was installed a submarine cable could have been laid joining the island and mainland, which would have supplied a better grade of service at less expense. But the conditions at that time, which grew out of the war, were such that the manufacture of cable would have involved a long delay. However, suitable submarine cable will be available in the near future and will be laid to the island as soon as available, but not before the new private radio system has received a thorough trial.

The radio system, even with privacy assured, can only be considered somewhat in the nature of a temporary affair. A cable could handle the messages more economically.

The installation of the cable will make the ether wave lengths now used by the radio system available for broadcasting or essential radio service.

The wireless link connects Catalina Island not only with Los Angeles, but also, through the trunk lines of the Bell system, with every commercial center in the United States. After the laying of the telephone cable between Key West and Havana, the longest telephone circuit on record was set up between Catalina Island in the Pacific and the Island of Cuba in the Atlantic.

Starting from Catalina Island, the first 30 miles of this circuit were wireless; from Los Angeles to Key West, a distance of 5,000 miles, the transmission was by long distance wires of the Bell system, and from Key West to Havana by 110 miles of submarine telephone cable.

The Catalina Island radio link is the first to be equipped with the wireless telephone privacy system recently developed by the engineers of the Bell system. Heretofore talks over the Catalina Island link have been "picked up" by amateur receiving stations in the region. The talker could not tell how far afield his words might go. The privacy system was designed to remedy this.

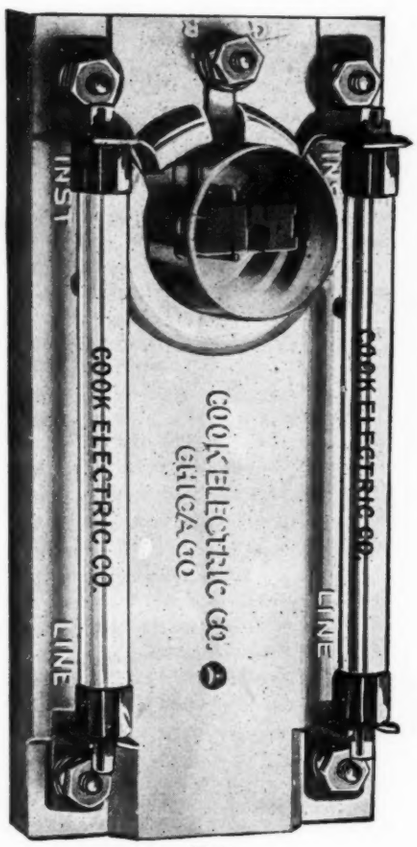
It is not claimed that the new system is absolutely secret, but at least privacy has been obtained, so that no one will inadvertently overhear the conversations which are transmitted.

The new radio equipment, before putting the messages on the air, will distort or "scramble" them, and no receiving set which is not specially designed or manipulated to "unscramble" them can obtain anything intelligible. While anyone familiar with the system, and possibly an ingenious person not familiar with it, might devise a set which could listen to the system, such a set would be much more complicated than the ordinary set, and the added complication would be of no value except for picking up transmission over this system. It is, therefore, not likely that many people will try it.

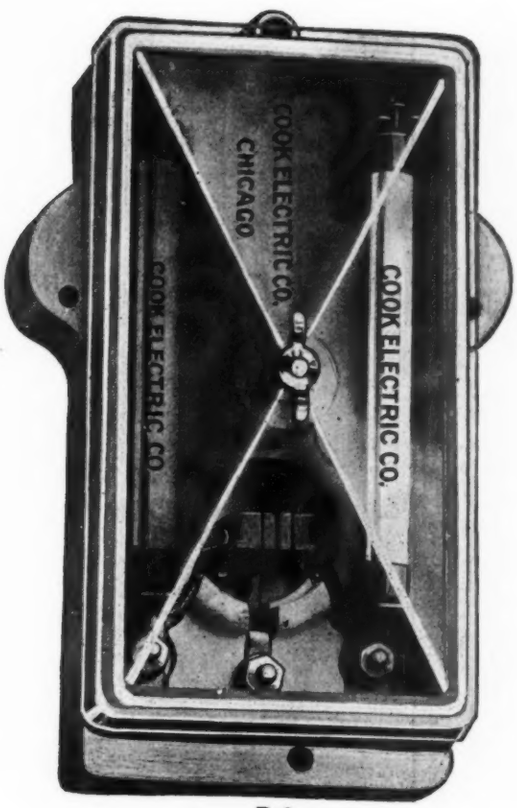
COOK

SUB STATION PROTECTION

Approved by Underwriters Laboratories



B-7



B-9

You Cannot Afford to Install a City Telephone Without Cook Substation Protection.

Cook Electric Company

2700 Southport Ave. **CHICAGO, ILL.**

Independent Makers Deserve Credit

Stromberg-Carlson Company Has Contributed Many Improvements to the Telephone Art—"The Story of Electricity," Edited by T. Cummerford Martin, Lists Some of the Accomplishments of the Rochester Concern

Reference was made recently in a TELEPHONY editorial to the important part played by Independent manufacturers in developing improved apparatus that help to make American telephone service the best in the world. Quotation was also made of a statement in an article appearing in the Nation's Business, which gave credit to the Independents for introducing many of the devices which have speeded up service and made it more efficient.

Among those who expressed approval of the comment made was W. Roy McCanne, treasurer and general manager of the Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y., who says in a letter to TELEPHONY that he is gratified to note such recognition of Independent contributions to the telephone art.

In his letter, Mr. McCanne quotes from "The Story of Electricity," edited by T. Commerford Martin and Stephen Leidy, which contains a chapter on "Independent Telephone Origin," that lists the principal achievements of the Stromberg-Carlson company in the development of apparatus.

This chapter (found in Volume 2) says:

"The Stromberg-Carlson company has been a pioneer and leader in many respects, and has produced equipment that at all times has been in step with its leadership of the development of the art. Some of its important advances that stand out are described below:

It was the first company to pay attention to mounting apparatus in switchboard cabinets so as to be accessible. Originally, relays, repeating coils, condensers and operator's circuit equipment, were mounted with apparent disregard for maintaining the equipment after the switchboard was installed.

In the early switchboards, it was necessary for the maintenance man to disturb the operator in getting at most of this apparatus, as panels had to be removed from the front of the cabinets to reach vital portions of the equipment.

Realizing through its customary close association with the operating companies the necessity of helping them solve operating and maintenance difficulties, the Stromberg company was quick to adopt schemes which would overcome such defects in switchboard design. Apparatus such as repeating coils and condensers were soon designed to mount on metal plates similar to relays, and later all of this apparatus was assembled on swinging relay gates, so that the maintenance man could get at both sides of the apparatus from the back of the switchboard and without disturbing the telephone operator.

Another advantage of this swinging relay gate was the placing of more of the switchboard apparatus in the cabinet than was heretofore the standard practice. This resulted in economies in wiring and greatly simplified the maintenance. In the standardized Stromberg P. B. X. switchboards, this accessibility has been further improved by mounting the trunk circuit apparatus on removable plates, which allow extensions or replacements to be made without the use of soldering irons.

The four-relay cord circuit, developed by this company, is the fundamental cord circuit used in the Independent telephone field today.

As four-party line service was developed, it was found necessary to have a key that would show the operator which subscriber had been rung last and the Stromberg-Carlson company met this need by the development of the four-party, plunger type, indicating key. Until recently this has been standard on all modern party line manual boards.

The requirements for telephone service underground in mines resulted in the development of the first iron-clad, moisture-proof special mine telephone which is purely a Stromberg product.

The bridge type of substation circuits for use in central energy telephone systems was also a product of the Stromberg-Carlson company.

Next, its organization was responsible for the first commercial two-gong harmonic party line telephone. They followed the first harmonic converter ringing machine, which practically revolutionized selective ringing and made possible the present extensive use of the four-party bridged selective ringing system.

The first instantaneous disconnect manual cord circuit, which made it possible for a talking subscriber to sever the talking circuit at the switchboard and institute another call without requiring the operator to take down the first connecting cord circuit, also was developed by it.

Another development was the first small-size, but highly efficient relay, which effected great economies in mounting space, operating and first cost.

It is generally conceded that the Stromberg organization also developed or marketed the first removable lever switchhook. This type hook allowed the telephone to be packed for shipment in a more compact shape and thus avoided injury to the internal mechanism. It is now used by most manufacturers of telephone apparatus.

The demand for a disconnect signal on the keyshelf for a magneto switchboard, that would function similarly to the disconnect signal on a central energy system, was met by the Stromberg company in the development of the famous No. 169 key, which mechanically restores the two associated disconnect signals, when the operator throws the listening key forward to answer a call.

During the Great War, the Stromberg company led in standardization work under the War Service Board, and apparatus models were quickly reduced to necessary types. As a consequence, untold good was done to the telephone industry.

During this period the first standardized stock magneto switchboard was developed on which every cord circuit was of a universal type, allowing interchange of connections between the different types of lines found in the country exchanges today, and containing the key type, double clear-out signal in the keyshelf and line signal code alarm drop. These boards were so designed as to be built and carried in stock, and packed securely and ready for shipment—an ideal arrangement believed impossible previous to that time.

In like manner the Stromberg company developed the standardized stock private branch board containing a removable type of circuit plate which allowed adaptation to different classes of service.

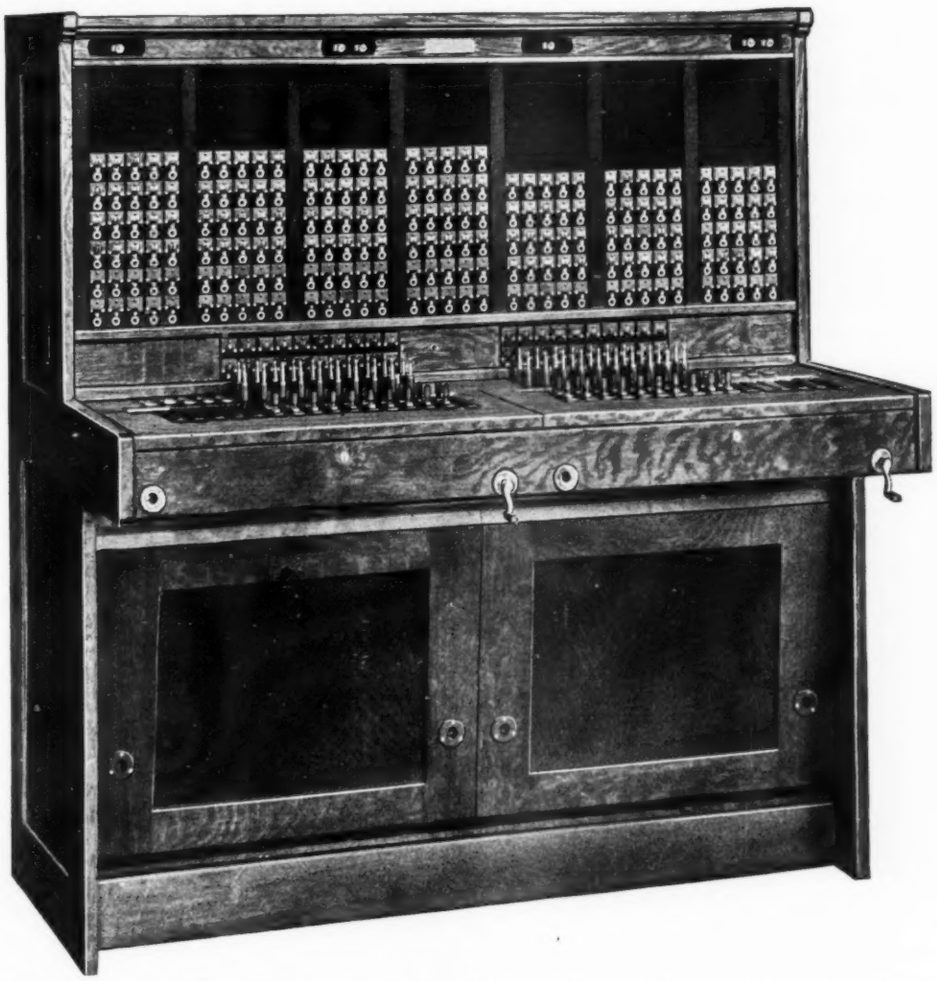
One of the latest developments of this company is the master key selective ringing system, which was first installed and is now in operation at Fort Wayne, Ind., and in which each keyshelf possesses but a single four-button key for a plurality of cord circuits. This scheme allows more calls to be completed in a given time by the operator and with less fatigue.

The Stromberg company was the first to manufacture and use in the United States the combined receiver and trans-

THE JOY OF BUSINESS.

Any man who goes to business with but one thought, asking grimly how much he is going to get out of it in dollars and cents, will probably get actually less dollars and little, if any, of the joy of the man who approaches the business from a quiet and different angle—from the angle of doing something worth while, building, creating, serving.—James Simpson, President, Marshall Field & Co.

"The Perfect Magneto Switchboard"



One of the largest users of Monarch equipment recently paid us the compliment of referring to the above switchboard, his most recent purchase, as the "PERFECT MAGNETO SWITCHBOARD."

Wired to full capacity of 320 lines.
Each position wired for 15 cord equipments.
Breast Plate or Suspended type operators' sets.
Straight or code ringing type drops and jacks.
Complete with all necessary switching keys.
Cable may leave cabinet at place specified.

Monarch Telephone Manufacturing Co.

GENERAL OFFICES AND FACTORY

951 W. Van Buren St., Chicago, Ill.

DISTRIBUTORS

Tel-Electric Co., Houston, Texas
Hendrie & Bolthoff Mfg. & Supply Co., Denver, Colo.
Electrical Supply Co., New Orleans, La.
Coker Electric Supply Co., Los Angeles, Cal.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

mitter telephone, known as the combination-phone or micro-telephone.

The Stromberg company also developed many unique features in the art of switchboard construction for better handling of increasing telephone traffic, among which was the installation at Knoxville, Tenn., in the year 1912. The fundamental principle of this installation was a lamp call-distributing system, in which the traffic was uniformly distributed to the idle operators by means of an automatic relay-controlled call order wire scheme. This produced quicker answering time, and more uniform service, as well as making an economical reduction in the operating force.

A further application of this system was made at Louisville, Ky., in which the lamp call-distributing equipment was principally used to handle the overflow traffic. It also facilitated the handling of the Sunday and night loads with a very much reduced operating force.

Later were produced the "concentrated lamp signals," where each line lamp with an associated jack is concentrated in one or two standard switchboard sections in the face equipment. These features were added to the switchboards in modern exchange installations such as Dixon, Ill., Oil City, Pa., and Fort Wayne, Ind. For the smaller exchanges the value of this ingenious arrangement resulted in the associated lamp signal multiple switchboard, which is standard today, ideal in economy of operating, and has improved the handling of telephone traffic.

A particular advance in the method of handling the problems today in traffic and operating practices has been developed by the Stromberg company in the cord circuit equipment installed at Fort Wayne, Ind.; Oskaloosa, Iowa; Mt. Vernon, Wash.; Mobile, Ala.; Bowling Green, Ky.; Franklin, Pa.; Lexington, Ky.; Centerville, Iowa; Hanover, Pa.; Bari, Italy; Rio de Janeiro, South America; Manizales, Columbia, South Amercia. This has revolutionized the former type of switchboard and affords a high standard of efficiency and economy.

The fundamental principle of this cord circuit retains the same basic four-relay system which played such an important part in the cord circuit design developed by Independent manufacturers. Additional features in this circuit were incorporated as labor-saving devices for the operators, permitting connections to be established with minimum physical effort. These improvements are as follows:

Machine ringing, which relieves operators of all manual ringing operations; flashing recall, which regains the operator's attention by an intermittent flashing signal on an established connection so as to promptly serve a subscriber's line that is plugged up and requires re-attention; keyless listening, which eliminates entirely the use of a listening key; operator's bar; advance plugging-in; operator's listening indication; operator's secret service; monotone ringing indication; instantaneous ringing cut-off; calling subscriber's ringing control; call registration; emergency ringing; and a master-key-controlled party line ringing by means of relay selection, which eliminates individual ringing keys per cord circuit.

These later developments in the art of switchboard construction are, it is asserted, by far more ingenious and helpful in advancing the art than any of the other early achievements in the recognized standards of telephone exchange switchboards."

Summaries of Reports of Class A Companies for March.

The 71 Class A telephone companies had 746,743 more stations in service at the end of last March than at the end of March, 1922, according to the statement compiled by the bureau of statistics of the Interstate Commerce Commission. This was an increase of 7½ per cent.

Total operating revenues increased 11.7 per cent for the month, and about the same for the first three months of the year, while expenses advanced something more than 8 per cent.

The item in the revenue which showed the largest percentage increase—both for the month and for the quarter-year period—was message tolls. This amounted to 17 per cent for March and 18 per cent for the three months.

Taxes assignable to operations took about 17 per cent more from the funds for the first quarter than during the preceding year.

Operating income was 18½ per cent greater for March and 20 per cent greater for the quarter than during these periods in 1922, while the ratio of expenses to revenues has decreased about 2 per cent.

District Meetings of Oklahoma Associations Are Postponed.

The district conference of the telephone division of the Oklahoma Utilities Association which was scheduled to take place at Broken Arrow last week, has been postponed to July 19, on account of floods. This was to have been the first of the season and the one at Quinton on June 21 the second. The latter meeting has been postponed one month—to July 21—for the same reason.

The programs for the Oklahoma district meetings contemplate a full day. The morning sessions open with the first talk at 9:30 a. m., and continue until noon. The afternoon sessions convene at 1:00 o'clock and adjourn about 5:00. In the evening there is a banquet and informal talks.

Item.	For the month of March		Increase or decrease (*).		For the three months ending with March.		Increase or decrease (*).	
	1923.	1922.	Amount.	Ratio, Pct.	1923.	1922.	Amount.	Ratio, Pct.
Number of company stations in service at end of month	10,716,156	9,969,413	746,743	7.5	.....	.....	.....	....
Revenues:								
Subscribers' station revenues	$34,066,194	$31,160,346	$2,905,848	9.3	$100,568,042	$92,175,549	$ 8,392,493	9.1
Public pay station revenues	2,536,467	2,230,900	305,567	13.7	7,156,792	6,349,686	807,106	12.7
Miscellaneous exchange service revenues	439,170	420,367	18,803	4.5	1,308,362	1,273,939	34,423	2.7
Message tolls	14,421,028	12,310,695	2,110,333	17.1	40,817,848	34,550,907	6,266,941	18.1
Miscellaneous toll line revenues	1,515,684	1,368,445	147,239	10.8	4,433,139	4,043,230	389,909	9.6
Sundry miscellaneous revenues	943,576	804,849	138,727	17.2	2,833,583	2,392,883	440,700	18.4
Licensee revenue—Cr.	1,968,824	1,753,738	215,086	12.3	5,835,595	5,229,002	606,593	11.5
Licensee revenue—Dr.	1,967,715	1,754,615	213,100	12.1	5,832,542	5,230,385	602,157	11.5
Telephone operating revenues	$53,923,228	$48,294,725	$5,628,503	11.7	$157,120,810	$140,784,811	$17,540,322	11.6
Expenses:								
Depreciation of plant and equipment	$ 7,702,117	$ 6,979,162	$ 722,955	10.4	$ 22,941,189	$20,767,738	$ 2,173,451	10.5
All other maintenance	7,240,127	6,794,967	445,160	6.6	21,583,981	19,798,427	1,785,554	9.0
Traffic expenses	14,451,934	13,216,686	1,235,248	9.3	41,849,843	38,733,993	3,115,850	8.0
Commercial expenses	4,758,047	4,503,430	254,617	5.7	13,850,442	13,211,177	639,265	4.8
General and miscellaneous expenses	2,543,129	2,253,733	289,396	12.8	7,266,531	6,788,357	478,174	7.0
Telephone operating expenses	$36,695,354	$33,747,978	$2,947,376	8.7	$107,491,986	$99,299,692	$ 8,192,294	8.3
Net telephone operating revenues	$17,227,874	$14,546,747	$2,681,127	18.4	$ 49,628,833	$41,485,119	$ 8,143,714	19.6
Other operating revenues	342	750	*408	*54.4	1,264	2,854	*1,590	*55.7
Other operating expenses	3,478	1,450	2,028	139.9	6,853	5,203	1,650	31.7
Uncollectible operating revenues	312,891	241,671	71,220	29.5	948,261	668,001	280,260	42.0
Operating income before deducting taxes	16,911,847	14,304,376	2,607,471	18.2	48,674,983	40,814,769	7,860,214	19.3
Taxes assignable to operations	4,231,472	3,608,071	623,401	17.3	12,622,523	10,791,305	1,831,218	17.0
Operating income	$12,680,375	$10,696,305	$1,984,070	18.5	$ 36,052,460	$30,028,464	$ 6,028,996	20.1
Ratio of expenses to revenues, per cent	68.05	69.88	*1.83	....	68.41	70.53	*2.12	....

Operating Statistics of Class A Telephone Companies for March, Compiled by Interstate Commerce Commission.

M C Tank may be strapped on back as shown.

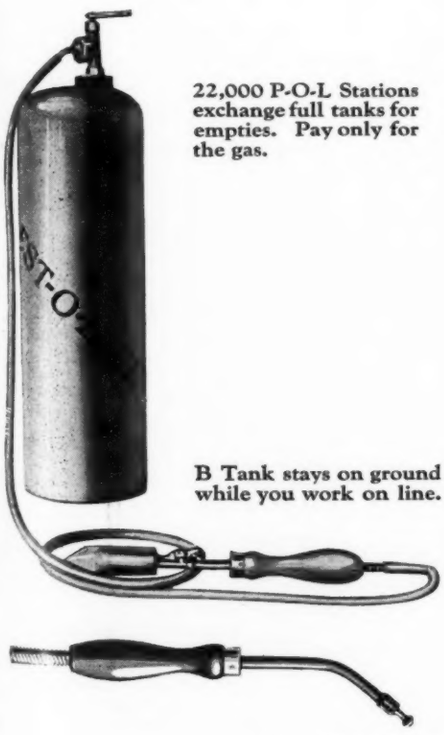
Carry your heat right along with you

Try the little Prest-O-Lite tank that saves you waiting, interruptions and delays. Hang the M C Tank over your back—it is light in weight. It gives you a concentrated easily controlled heat that saves you time and steps, and makes you master of your job. Or leave the B Tank on the ground, carrying up only the tubing and torch.

No extra irons to carry and heat—no pre-heating—no climbing up and down—no irons cooling at the critical moment.

Prest-O-Lite is right on the job as long as you want it. It is the efficient tool of the efficient man.

Wherever there is line work there is one of the 22,000 Prest-O-Lite stations ready to furnish equipment and to exchange full tanks for empties. No charge except for gas. Write us for details and the name of your dealer.



22,000 P-O-L Stations exchange full tanks for empties. Pay only for the gas.

B Tank stays on ground while you work on line.

Prest-O-Lite Gas

THE PREST-O-LITE COMPANY, Inc.
SMALL TANK SALES DEPARTMENT
Indianapolis, Indiana

New York Office: 30 East 42nd St. Pacific Coast Office: 599 Eighth St., San Francisco
In Canada: Prest-O-Lite Company of Canada, Ltd., Toronto

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

From Factory and Salesroom

Officers of Automatic Electric and International Sales Corporation.

The annual meeting of the board of directors of the Automatic Electric Co. was held at the offices of the company in Chicago on June 12. The report submitted by the officers of the company showed that the corporation is operating on a very full schedule for the year with its output largely sold and with the prospect for future business most bright.

Several changes were made in the executive organization of the company: Theodore Gary retired as chairman of the board, but will continue to serve as chairman of the executive committee. Mr. Gary was succeeded as chairman of the board by A. F. Adams, who retired as president of the company in favor of H. L. Gary, and H. L. Harris was elected vice-president. Other officers who were re-elected are:

H. A. Harris, vice-president and general manager; A. E. Keith, vice-president in charge of development and research; Grant Pelton, vice-president in charge of production; Walter I. Patton, secretary; and W. F. Benoist, treasurer.

Theodore Gary's many activities, including the important work which he is carrying on as chairman of the Missouri Highway Commission, make it impossible for him to give as much time as formerly to the affairs of the Automatic Electric Co., although his position as chairman of the executive committee will continue to keep him in intimate touch with its affairs.

The election of H. L. Gary to the presidency of the Automatic Electric Co. is in line with the policy which makes Mr. Gary the active executive head of the various Gary manufacturing enterprises. Mr. Gary is also president of the Monarch Telephone Mfg. Co. and of the International Telephone Sales & Engineering Corp.

H. L. Harris' election as vice-president of the Automatic Electric Co. is also in accordance with company policy, Mr. Harris being vice-president and executive officer of Theodore Gary & Co., as well as vice-president of the several other corporations associated with Theodore Gary & Co. Mr. Harris' long experience in the telephone field, some eleven years of which were spent with the Dean, Garford and Stromberg-Carlson manufacturing companies, especially fits him for his enlarged duties.

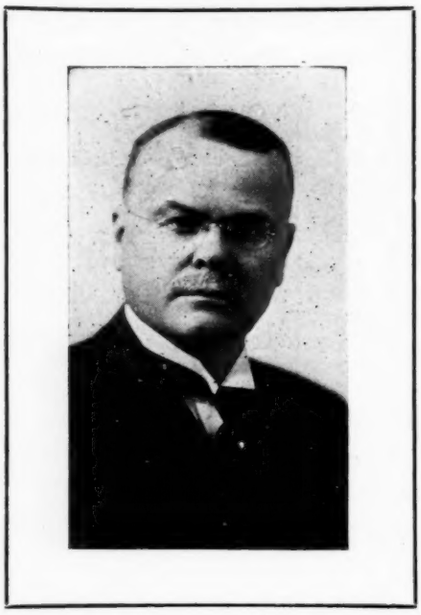
As an executive vice-president of the Gary manufacturing properties, Mr. Harris will spend a portion of his time in Chicago as well as in Kansas City, where he will still retain his official connection with the Kansas City Telephone Co.

On the same day the annual meeting of the stockholders and directors of the International Telephone Sales & Engineering Corp. was held in Chicago, at which meeting the following directors were re-elected: Theodore Gary, A. F. Adams, H. L. Gary and H. L. Harris, all of Kansas City, Mo.; F. H. Woods of Lincoln, Neb., and H. A. Harris, Chicago.

The directors elected the following officers for the ensuing year:

A. F. Adams, chairman of the board; H. L. Gary, president; H. A. Harris, vice-president; H. L. Harris, vice-president; C. A. Bennett, treasurer, and W. F. Benoist, secretary.

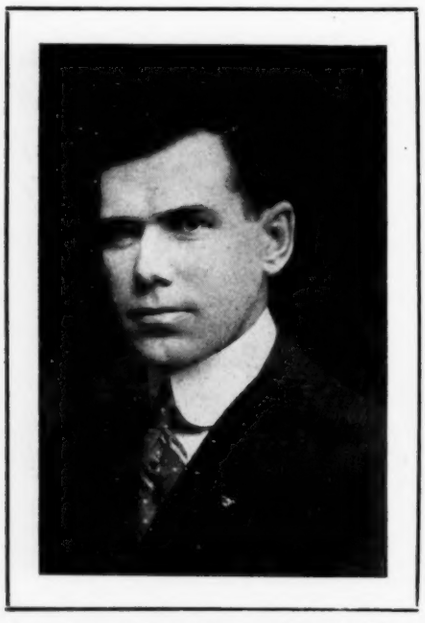
O. V. Dodge was appointed sales manager.



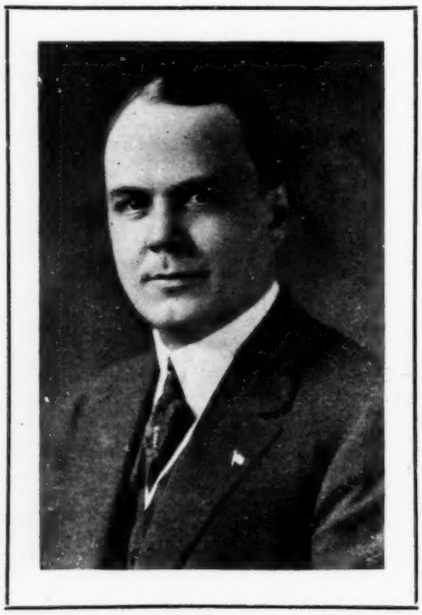
Theodore Gary, Chairman of Executive Committee of Automatic Electric.

Business Is Good on Bierce Guy Wire Protectors and Augers.

The Specialty Device Co. of Cincinnati, Ohio, advises that, at the present time, it is enjoying a splendid business on Bierce guy wire protectors and standard earth augers. Both of these specialties are used extensively by telephone companies and other



H. L. Harris, Executive Vice-President of Manufacturing and Sales Organizations.



H. L. Gary, New President of Automatic and International Companies.

A. F. Adams, Chairman of Board, Automatic and International Organizations.

Like Nigroli Armor

Men had to be men in the days when fighting clothes often weighed as much as 35 or 40 pounds.

French Telephone Batteries Are Proof Against Hard Service

The skill of the old armor makers developed a fabric of steel links, soft and pliable like cloth yet capable of turning the thrust of a dagger. The force of the blow might stun the recipient but the blade could not penetrate. In the days when fighting was the principal business as well as pleasure, this armor was subjected to very severe service, but the work of the master armorers survives to this day.

French Telephone Batteries are designed and built with the peculiar demands of telephone service in view. They must deliver adequate current when in use, yet with idle loss reduced to the minimum. They must have long life. How well French has analyzed the needs of telephone service is clearly shown by the fact that thousands of telephone companies use French Telephone Batteries *exclusively.*

FRENCH BATTERY & CARBON COMPANY, *Madison, Wis.*

Atlanta Dallas Denver Chicago New York Minneapolis Kansas City

For years French Telephone Batteries have stood for the highest development of practical battery efficiency.

FRENCH
TELEPHONE BATTERIES

public utility concerns in all sections of the country in connection with the extensive construction work which has been going forward this year.

Circulars descriptive of these articles will be gladly furnished on request, also circulars of "Bierce" guy anchors.

The Specialty Device Co. also announces that some time ago it discontinued the manufacture of Bierce cable sleeves and Bierce cable sleeve terminals.

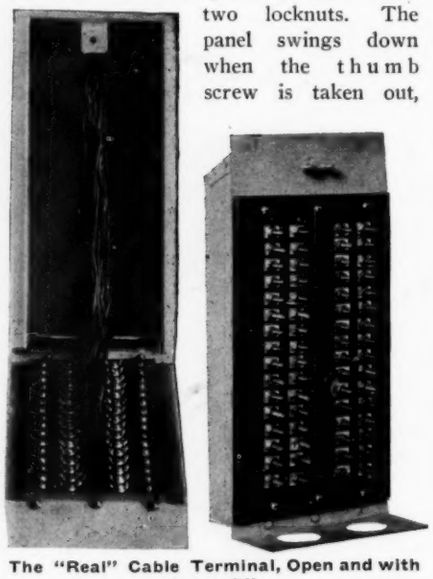
A New Style Cable Terminal—The "Real" Terminal.

A new cable terminal, developed by a man who has spliced cable for 23 years and worked on all kinds of terminals, has recently been placed on the market. It is known as the Real terminal and is supplied in three sizes, either protected or unprotected—for 10-pair, 15-pair and 25-pair cable.

The housing of the Real terminal is made of No. 16 gage ingot iron which is lead coated to prevent rusting, and there are no soldered seams. It has a slip cover and is practically waterproof. The handle on the cover is strong and is designed to hang on the pole step.

The panels of the terminal are made of white selected maple, properly prepared, which means less low insulation trouble and better service. It will not chip and break or sweat.

The lugs are the double type which make it possible to cut in new leg without in any way interfering with or slowing up the service. The binding posts pass through the cable lug to the line side of the panel and are made fast by a lock washer and two locknuts. The panel swings down when the thumb screw is taken out,



The "Real" Cable Terminal, Open and with Cover Off.

and the repairman knows at once whether the trouble is on the cable side of terminal. The fuses are of the mica type and, it is stated, cannot work loose and cause shorts, crosses, etc., because of vibration of the pole.

The lead sheathed, rubber-covered pothead type cable goes to the top of the terminal and is securely fastened by a cleat. It lies close to the pole, thereby eliminating trouble due to hand or footholds.

"If by chance at any time the cable goes bad," the manufacturer instructs, "just take out the cleat holding the cable in place, move the old cable over and take out the slide bottom, which gives plenty of room to place a new cable. Put on the cleat, half-tap the new cable, and cut over. Cut off the old cable, put in the slide bottom—and the job is complete. All you renew is your cable.

"You have done your work just once and in half the time, and have not had to transfer lines."

Complete information regarding the Real cable terminal may be obtained from the manufacturer, Irwin M. Cook, 13508 Garden Road, East Cleveland, Ohio.

Carthage, Mo., to Have Strowger Automatic Exchange.

Carthage, the third largest city in Missouri and the home of the far-famed Carthage marble, is to have a complete new telephone exchange, which, when completed, will be as up-to-date as the best in the country, and in keeping with the other important features of the city's growth.

Telephone service is at present being furnished to Carthage subscribers by two

A NET INCREASE IN REVENUE!—

Can be obtained **only** by getting that construction work done economically. Your tools and equipment have a great deal to do in this direction. If you use

IWAN AUGERS & DIGGERS

You will be certain to save money on time and labor. They are designed especially for pole and anchor hole digging and are becoming standardized by telephone companies all over the country.

IWAN tools are recommended by the leading anchor manufacturers. Do you want further proof of our **desire** and **ability** to fill your requirements.

Write Us for Descriptive Booklet Today.

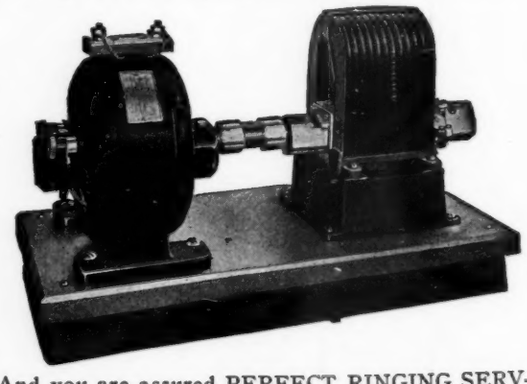
IWAN BROTHERS
South Bend, Indiana
U. S. A.

Constant Voltage
Constant Frequency

Do *YOU* Have These Conditions In *YOUR* Exchange?

Install the Holtzer-Cabot

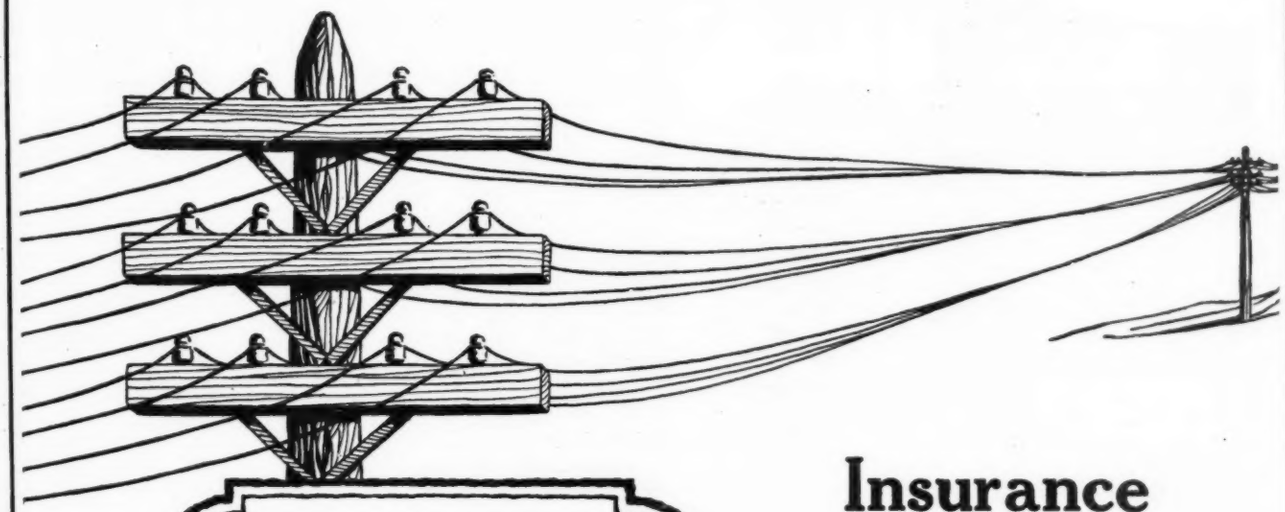
Magneto-Ringing Motor-Generator



And you are assured PERFECT RINGING SERVICE under all conditions. You owe this to your subscribers and you owe it to your exchange.

IT PAYS!

THE HOLTZER-CABOT ELECTRIC CO.
Chicago Boston



The Policy

Of Lynton T. Block & Co. is to issue the most satisfactory and comprehensive insurance to be had anywhere—

Furnishing absolute protection at cost

Embodying all the standard features and more

Covering special classes and selected risks

Selling at established rates

Returning savings at the end of the policy period, depending upon the individual experience of the risk.

Giving a claims service that is not equalled elsewhere

It is an honest policy, carried out in an honest way and gives a square deal under all conditions.

This forms the creed of every member of the organization and has built up the reputation of Lynton T. Block & Co. until it is one of the best and most favorably known in the Mississippi Valley.

Insurance at Cost

LYNTON T. BLOCK & CO. ★ PROTECTION AND SERVICE ★

WORKMEN'S COMPENSATION
EMPLOYERS' LIABILITY
PUBLIC LIABILITY
TEAMS LIABILITY
CONTRACTORS' LIABILITY
ELEVATOR
PLATE GLASS
AUTOMOBILE

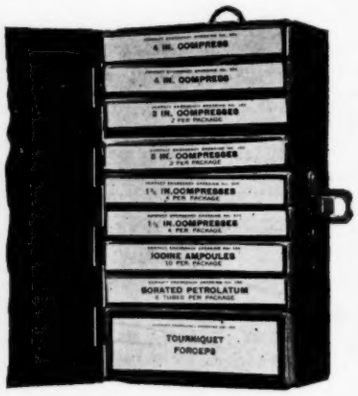
LYNTON T. BLOCK & CO.

Underwriters of Insurance at Cost

Utilities Indemnity and Fire Exchange
Employers Indemnity Corporation

Chamber of Commerce Bldg.
ST. LOUIS, MO.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.



FOR THE SMALL GANG

engaged in cable splicing, drop wire installing and construction work—the gang that may be miles from hospital or surgeon when an accident happens—C. E. D. Kit No. 10 has been especially designed.

The Compact Emergency Dressings are fitted in a solid 16-Gauge Steel Case. Each dressing is a complete application for a specific injury and the No. 10 kit is supplied with sufficient dressings to treat the special hazards of this branch of telephone work.

We specialize in Industrial First Aid and our equipment is used by some of the largest industries in the world.

Send for Booklet T-6

First Aid Specialty Company, Inc.

35 Nassau Street New York

offices, one operated by the Southwestern Bell Telephone Co., giving common battery service, and the other by the Joplin Home Telephone Co. giving magneto service. In response to public demand for the elimination of competition and for improved service standards, plans have been completed for the merging of the two systems and the replacement of both of the manual exchanges with a single Strowger automatic exchange.

The present common battery central office is located in rented quarters while the Home company's office building is company-owned. It fortunately happens that the latter building is so designed and situated that it is possible to effect such alterations and additions as may be required by the installation of the new equipment without great difficulty, thus avoiding the necessity for erecting an entirely new building.

In this way the Home company's building, with the extension now in course of construction, will house all of the automatic equipment necessary to care for the traffic of the merged system.

The automatic exchange will be of the four-digit type with the standard three-digit code for special services. The initial installation will consist of 1,700 plunger type line switches trunking to first selectors through 170 rotary secondary line switches. The connectors will be divided into 25 groups, providing 2,500 subscribers' terminals.

Each connector group will consist of seven combination toll and local connectors and one test connector. In this way both the Carthage subscribers and the toll operator will have access to all of the connectors in each group. The toll operator will have access to the connector equipment through a chain of toll selectors.

For private branch exchange service there will be installed a group of P. B. X. (rotary) connectors, three for the exclusive use of the toll operator and nine for local service only.

An intermediate distributing frame is to be provided so that any line switch may be cross-connected to any line in the office. Four-party service will be full selective on a jack-per-station basis, using two frequencies with two parties reversed on the line. Eight-party service will be semi-selective on a terminal per station basis, using two frequencies, reversed line, and one and two rings.

With the completion of the new telephone system, Carthage will have added another commercial and social advantage to the many it already possesses. Located in the Ozarks, Carthage is the center of a prosperous agricultural region as well as a rapidly growing dairy district. Carthage is also the home of the wonderful Carthage marble, a stone recognized by architects everywhere as one of the finest building materials available.

The Carthage business interests are represented by a Chamber of Commerce of more than 600 members, who, incidentally, registered their complete approval of automatic telephone service at a recent demonstration of Strowger equipment at one of their meetings.

Automatic Telephone Service on the S. S. "Conte Verde."

The automatic intercommunication telephone system on a liner is nowadays considered one of the most important features of the equipment, and an installation of the most modern type has now been fitted on the S. S. "Conte Verde" of the Lloyd Sabaude Line. This system was manufactured and installed by the Relay Automatic Telephone Co., Ltd., of Marconi House, London, a similar exchange being installed on the B. B. "Conte Rosso" last year with eminently satisfactory results.

The "Conte Verde" will carry an automatic exchange with 26 connections, the exchange, however, being capable of extension of the system up to 35 lines at any time without disturbing the existing service. Automatic telephones are fitted in the navigating offices, cabins, engineers' quarters, staterooms, smoke rooms, saloons, etc.

From a shipbuilding point of view, the simplicity of running only twin wires in lead-covered cables is a great advance on the multi-cables required in the old-fashioned inter-communication systems.

Condenser Making an Art with Automatic Electric Co.

Probably less thought is given by the average telephone man to the ordinary telephone condenser than any other piece of telephone equipment—yet to make a condenser that will stand up under all conditions of service it must be made of the best materials and with the utmost care. Realizing this, the Automatic Electric Co.'s engineers have made a special study of condenser construction, and their product is said to be one of the most scientifically constructed available.

The rice paper, tinfoil and thin sheet copper, of which their condensers are made, must be dry, clean and without a flaw or spot. Special machinery is required to wind the rice paper and tinfoil properly to obtain accurately the necessary number of turns. The thin copper contacts, that are later soldered to the terminals, are carefully cleaned with an acid before assembly.

At this stage it is placed in a "condenser baking oven," automatically kept at a temperature of 270 deg. Fahrenheit, for a period of 36 hours. The next operation is to place it in a "paraffine vacuum tank" where it is boiled in paraffine for 15 minutes. After being removed from the boiling paraffine and cooled, it becomes an extremely hard mass and is then placed in a tin container and its copper contacts are

Binds Any Load Securely and Safely

Stacy Load Binders eliminate all risk and danger of binding poles, lumber, etc., as with the old fashioned, dangerous boom poles. You simply pass chain around the load—attach the two hooks of the Stacy Binder in the links of the chain —pull down the lever and your load is *bound* and *bound* to stay.

Telephone companies find

Stacy Swivel Load Binders

big time and labor savers—also a big factor in preventing serious and expensive accidents caused by loads slipping off.

Stacy Load Binders are made in two sizes—Regular and Jumbo. Regular size sells for $2.50 each—$5.00 a pair. Jumbo size sells for $3.75 each—$7.50 a pair. For sale by leading hardware dealers and hardware jobbers. If your dealer can't supply, order direct from

EUGENE C. STACY, Manufacturer
TIFFIN, OHIO

Mr. Eugene C. Stacy,
Tiffin, Ohio.

Dear Sir:

I will state the question of using the Load Binder, as described in your circular, was taken up at our Accident Prevention Committee Meeting and everybody agreed that they were O. K., and instructions have been issued to order as many as necessary.
The Chairman of the General Accident Prevention Committee has been trying them out, and my last report was that they were entirely satisfactory and that they would be made standard and would replace all boom poles.
If you have not received any orders direct, you will probably receive same from the Western Electric Company, as all our material is ordered through them.

Yours very truly,
(*Name on Request*)
Dist. Superintendent of Plant.

"INDIANA"
TELEPHONE AND TELEGRAPH WIRE

PROVEN BEST BY TEST

Time and the aid of America's foremost engineers, have enabled us to develop and manufacture the highest grade wire known to the trade. It is greatest in conductivity and lasting qualities, due to the superior quality of material from which it is made, as well as its *Extra Double Galvanizing*, which insures longest life.

STEEL STRAND

Single and Double Galvanized, Standard, Siemens-Martin, High Strength and Extra High Strength Grades.

HANDLED BY MOST JOBBERS

MANUFACTURED BY
INDIANA STEEL & WIRE CO.
MUNCIE, INDIANA

No Tools Necessary

If you want quick work and a cable ring that is strong, safe, durable, economical, flexible, and serviceable, specify

BONITAS

Standardized by A. T. & T. Co.

CAMERON APPLIANCE CO.
EVERETT, MASS.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

soldered to the terminal block. A boiling mixture of tar and oil is then poured in to fill the small space between the terminal block and lid.

The condenser is now absolutely moistureproof and airtight. Other operations, such as washing in benzine, wire brushing, painting, etc., are completed before the final severe breakdown tests of 500 volts direct current and 350 volts alterating current are applied.

Paragraphs.

JAMES B. NICHOLSON, of Sydney, Australia, chairman and managing director of Automatic Telephones, Australasia, Ltd., is in the United States on agency matters. Mr. Nicholson is spending considerable time at Kansas City, Mo., and Chicago in consultation with the officers of the Automatic Electric Co. with regard to the development of automatic telephony in his part of the world. He is accompanied by his wife, two daughters and a son.

A. A. BURCH, of Sydney, Australia, one of the representatives of the Automatic Electric Co. in Australia, is spending several weeks in Chicago. He reports that the automatic telephone is becoming more and more popular in Australia and New Zealand, where it is in successful operation.

LYMAN Q. TRUMBULL, general manager of the Monarch Telephone Mfg. Co., Chicago, and manager of sales for the manual division of the Automatic Electric Co., is making a six-weeks' trip through the Pacific Coast territory. He is accompanied by Mrs. Trumbull.

Prices in the Metal Markets.

New York, June 18.—Copper—Quiet; electrolytic spot and futures, 15⅛@15¼c Tin—Easy; spot and nearby, $40.62@40.75; futures, $40.25@40.37.

Valuations—Supervision—Plant—Inductive Interference
Expert Administrative Counsel for Utilities
JAY G. MITCHELL
TELEPHONE ENGINEER
Member A. I. E. E.
1042 W. Monroe St. Springfield, Ill.

Frank F. Fowle & Co.
Electrical and Mechanical ENGINEERS
Monadnock Building CHICAGO

Appraisals Rate Investigations
The American Appraisal Co.
A Quarter Century of Service
MILWAUKEE NEW YORK CITY
Financial Reports

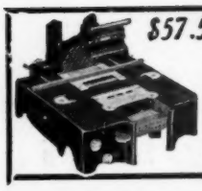
CHAPMAN
LIGHTNING ARRESTERS
Manufactured by
MINNESOTA ELECTRIC CO.
Minneapolis, Minn.

W. C. POLK
CONSULTING TELEPHONE ENGINEER
Plans, Estimates and Reports,
Appraisal and Supervision
Can arrange a moderate amount of financing.
Telephone Bldg. Kansas City, Mo.

W. H. CRUMB
Telephone Engineer
9 South Clinton St. Chicago

Charles W. McKay
And Associates
"A Balanced Consulting Service at Reasonable Cost"
646 NO. MICHIGAN AVE.
CHICAGO
Telephone—Superior 6535

CEDAR POLES
Northern White and Western Red
C. P. TINKHAM
1011 Majestic Bldg.
MILWAUKEE WIS.


$57.50 Addressograph
"Typewrites" names, addresses and rates on bills. 1000-1500 an hour.
FREE TRIAL—EASY TERMS
906 W. Van Buren St., Chicago

KESTER Acid-Core WIRE SOLDER
"REQUIRES ONLY HEAT"
SAMPLE FREE
CHICAGO SOLDER CO. 4203 Wrightwood Ave., CHICAGO

TELEPHONE ACCOUNTING
"COFFEY SYSTEM"
The Independent Standard
Coffey System and Audit Co., C. P. A.
118 E. New York Street
Indianapolis, Ind.
Exclusive Telephone Accountants

American Electric
TELEPHONES
SWITCHBOARDS and SUPPLIES
Carried in Stock by
Southern Electric Supply Co.
Atlanta, Ga.

GOVERNMENT ACCOUNTANT During Federal Control
Systems of accounts installed to meet the requirements of Federal and State regulatory bodies, annual audits, financial reports, income tax matters, rate case material prepared, filed and presented.
CARLTON G. VAN EMON
PUBLIC UTILITY ACCOUNTING
921 Fifteenth St. N. W., Washington, D. C.

THE BOWDLE SYSTEM
Always shows you where you stand.
We have solved the bookkeeping problem of a large number of companies.
Write us about our monthly audit.
Bowdle Accounting System
Cerro Gordo, Illinois

GUSTAV HIRSCH, M.E.
CONSULTING ENGINEER
COLUMBUS, OHIO
Appraisal Construction Reports

A complete stock of
KELLOGG TELEPHONES
TELEPHONE SUPPLIES
NORTHWESTERN ELECTRIC EQUIPMENT COMPANY
SAINT PAUL AND DULUTH, MINNESOTA

J. G. WRAY & CO.
Telephone Engineers
Specialists in Appraisals, Rate Surveys, Financial Investigations, Organization, and Operation of Telephone Companies.
J. G. Wray, Fellow A. I. E. E.
Cyrus G. Hill
1217 First National Bank Bldg., Chicago

The "STEWART" Test Cabinet
Tells you if your line is short, crosses, or grounded and how many miles it is from you. So simple the operator can use it as easily as the men. Reads direct.
Sent on trial
STEWART BROTHERS
Ottawa, Ill.

CONSULTING
Telephone Engineer
GARRISON BABCOCK
800—20 East Jackson Blvd., Chicago, Ill.
Telephone Wabash 5212

Vitrified, Glazed, Clay Conduit

Guaranteed to possess all the characteristics for *satisfactory* and *permanent* service.

We carry large stocks of round singles, square singles, two, three, four, six and nine duct, in standard and short lengths, in splits, mitres, and bends.

Send today for complete particulars and prices.

THE CLAY PRODUCTS COMPANY
BRAZIL INDIANA

The Right Tool for the Right Job
Every OSHKOSH Construction Tool is exactly designed and made to do a particular job, and do it well. Long experience has taught certain features of design which speed up the job. The efficiency of OSHKOSH Construction Tools is likened only to their quality, which is second to none.
OSHKOSH MFG. CO.
138 Tell St. Oshkosh, Wis.
OSHKOSH
Construction Tools

HAZARD

Rubber Insulated
TELEPHONE WIRE

Uniform in construction Hazard Insulated Wires and Cables give uniform service. Made of the best of materials and by highly skilled workmen. Experience, knowledge and honesty of purpose insure long life and ultimate economy.

1848—1922

HAZARD MANUFACTURING CO.
New York Pittsburgh Chicago
Denver Birmingham
Wilkes-Barre, Pa.

Makers of Quality Wire Rope since 1848

To the Telephone Trade:

We are in excellent shape to give prompt attention to your orders for any of the following specialties:

"Bierce" Guy Anchors
"Bierce" Guy Wire Protectors
"Standard" Earth Augers

Many of the leading independent telephone companies have been using these articles for years and are thoroughly familiar with their merits. If you are not yet on our list, write for catalogs and prices.

The Specialty Device Co.

Cincinnati, Ohio

Manufacturers of patented specialties for the telephone trade.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

Condensed Telephone News

Officers of Companies Are Urgently Requested to Forward to Us Promptly All Financial and Other Statements as Soon as Issued and Any Items Relating to Construction, Rebuilding, or Changes in Their Plants and Systems

New Telephone Companies and Incorporations.

DINUBA, CALIF.—The General Grant Park Telephone Co. has been organized with a capital stock of $50,000, divided into 1,000 shares of $50 par value each—$250 of which is subscribed.

IOLA, KANS.—The Neosho Valley Telephone Co. has been organized with a capital of $500.

RUSH CENTER, KANS.—The Rush Center Telephone Co. has been organized with $5,000 capital stock.

RUSH, KY.—H. J. Ross, C. Bolt and W. Rife have incorporated the Bottsfork Telephone Co. with $2,000 capital stock.

ORANGEVILLE, OHIO.—C. A. Hobart, R. F. Pruden, E. C. Boyd, J. H. Case and E. U. Hydr have organized the Jefferson & Warren Telephone Co. The capital stock mentioned is $10,000.

PORTLAND, TENN.—An application for a charter has been filed by the Buntin Farm Mutual Telephone Lines, in which W. E. Freedle, M. Caudill, N. E. Armstrong, D. Potts and R. Harris are named as incorporators.

BUCKHANNON, W. VA.—Articles of incorporation have been filed for the Upshur Telephone Co. The incorporators are E. M. Anderson, M. Anderson, F. Kesling, W. O. Hinkle and A. L. Hinkle, and the capital is $5,000.

Financial.

GROVER HILL, OHIO.—The Country Home Telephone Co. has declared its first dividend. The company has been in operation for years as a mutual concern.

Construction.

LEXINGTON, KY.—The Fayette Home Telephone Co. has announced its plan to place another section of its cables underground. The cost will be about $45,000.

WASECA, MINN.—Improvements at a cost of between $15,000 and $20,000 are to be started soon by the Waseca Telephone Co. The plan includes installing about five miles of underground cable.

SANTA FE, N. MEX.—The Mountain States Telephone & Telegraph Co. has begun work on a new $50,000 toll line from Santa Fe to Espanola. Telephone service to Nambe and Pojuaque, hitherto without service, will be added. It is the plan to extend the Espanola line finally to Taos.

TARBORO, N. C.—An improvement which contemplates the expenditure of about $500,000 has been started by the Carolina Telephone & Telegraph Co. It is planned to run new copper circuits to various towns in the district, as well as to improve the service at Fayetteville. An addition will be made to the exchange building in Fayetteville, a new building will be built at Dunn, and work has been started on a new exchange building at Washington.

ADA, OHIO.—A rehabilitation program, to be completed within six months, has been announced by D. H. Hering, general manager of the Ada Telephone Co.

NEWARK, OHIO—Improvements to the outside plant of the Newark Telephone Co. are to be started within the near future.

HARRISBURG, PA.—The Cumberland Valley Telephone Co. will construct additional lines from Harrisburg through Penbrook and Progress to Linglestown, from Lemoyne through Camp Hill, to Chambersburg and to Enola, it has been announced. The cost is estimated at about $200,000.

EMERY, S. D.—The Tri-County Mutual Telephone Co. is making many improvements to its system. Over six miles of new poles and wires have been installed to replace obsolete rural lines, and other improvements are being made right along.

FAITH, S. D.—A. N. Van Camp, of Highmore, who has purchased the exchange at Faith, has had a force of men busy for some time repairing, readjusting and overhauling the exchange.

BRISTOL, TENN.—The Intermountain Telephone Co. will start work soon on its new building, which is part of a large construction program planned for this year. New equipment will be installed, including a new common battery system.

COLUMBIA, TENN.—A new switchboard has been installed by the Citizens Telephone Co.

Elections.

CODELL, KANS.—At the recent annual meeting the following officers were elected for the Codell Telephone Co.: President, G. Zeigler; vice-president, R. W. Gilpin; secretary, E. N. Sidwell; treasurer, P. Matson. D. Brummett was elected a director.

HARRISBURG, PA.—At their recent annual meeting the stockholders of the Cumberland Valley Telephone Co. elected as directors: S. W. Foulkes, E. Clay Krebs, F. E. Zimmerman, W. E. Weller, A. E. Pendergast, J. C. Motter, C. L. Long, W. J. Lescure and W. F. Rauch. Officers for the coming year are: President, W. J. Lescure; vice-president, J. C. Motter; secretary-treasurer, O. K. Kines. S. W. Foulkes is chairman of the board, and C. L. Baer, general manager of the company.

Miscellaneous.

BERRYVILLE, ARK.—R. E. Norris has bought the controlling interest in the Berryville Telephone Co. and will assume management.

BANCROFT, MICH.—The Union Telephone Co., of Owosso, has purchased the property of the Shiawassee Mutual Telephone Co. in Bancroft.

ST. JAMES, MO.—C. A. McComb has sold the St. James Telephone Co. to W. E. McComb, at a stated price of $12,000.

TIFFIN, OHIO.—By virtue of an ordinance recently approved, the Tiffin Consolidated Telephone Co. will commence work soon on its underground cable system.

HELP WANTED

WANTED—Manager for an exchange of 4,000 stations. Advise experience in telephone business and submit references with reply. Address 5327, care of TELEPHONY.

WANTED—Experienced automatic maintenance switchman familiar with two wire equipment. Salary $165 month. Apply Santamonica Bay Home Telephone Co., Ocean Park, Calif.

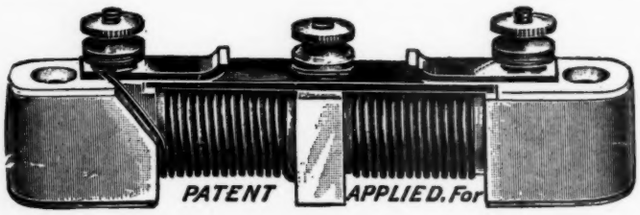
HELP WANTED—Switchboard wiremen. We are in need of several first class telephone switchboard wiremen and cable layout men for factory work. Address Automatic Electric Co., 1001 W. Van Buren St., Chicago, Ill.

WANTED—First-class cableman. Must be able to locate trouble. Good wages and steady employment. H & C Telephone Co., Clearfield, Pa.

ARGUS PROTECTION MEETS EVERY REQUIREMENT

The dependability of ARGUS Arresters is almost proverbial among telephone men. When you install these economical but sure protectors, you enjoy real immunity from lightning and other electric troubles.

ARGUS STANDARD Type A



TYPE "C" COMBINED ARGUS LIGHTNING ARRESTER AND HIGH TENSION PROTECTOR

offers you adequate protection against high tension currents as well as the other proven features of Argus Arresters. Simple, foolproof, adaptable.

Write for literature

Foote, Pierson & Company, Inc.

160 DUANE STREET, NEW YORK CITY